



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

### Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

### About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>

~~500 320.5~~

~~6-11-62 13, 21, 700~~

Pr2208



**Harvard College Library**

FROM THE

**UNITED STATES GOVERNMENT**

THROUGH

SCIENCE CENTER LIBRARY











THE  
AMERICAN EPHEMERIS

AND  
NAUTICAL ALMANAC

FOR THE YEAR

1904

*FIRST EDITION*

---

*PUBLISHED BY AUTHORITY OF CONGRESS*

---

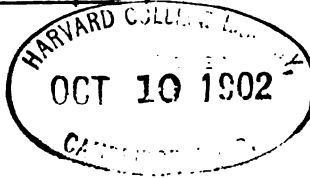
WASHINGTON  
BUREAU OF EQUIPMENT

1901

~~Sci 320.5~~

~~2213.21401~~

Per 2208



**AN ACT PROVIDING FOR THE PUBLIC PRINTING AND BINDING AND THE  
DISTRIBUTION OF PUBLIC DOCUMENTS.**

*Sec. 73. Of the Ephemeris and Nautical Almanac and of the papers supplementary thereto, one thousand five hundred copies; one hundred copies for the Senate, four hundred for the House, and one thousand for distribution or sale by the Navy Department. The five hundred copies printed for Congress and the usual number shall be for the calendar year next following, and those for the Navy Department for the third year following. The Secretary of the Navy is also authorized to cause additional copies of the Ephemeris, and of the Nautical Almanacs extracted therefrom, to be printed for the public service and for sale to navigators and others: Provided, That all moneys received from sales of the Ephemeris and of the Nautical Almanacs shall be deposited in the Treasury and placed to the credit of the general fund for public printing.*

*Approved, January 12, 1895.*

## PREFACE.

---

The general arrangement of the *American Ephemeris and Nautical Almanac* is the same as in the volumes since 1900. The ephemeris of Uranus, however, has been computed from NEWCOMB'S tables, published by this office as part 3 of volume 7 of the *Astronomical Papers* prepared for the use of the *American Ephemeris and Nautical Almanac*; and the times of elongations of Mimas and Tethys have been deduced from the elements of HERMANN STRUVE instead of from the tables formerly used, which were constructed in this office.

The Ephemeris is divided into four parts, as follows:

Part I, *Ephemeris for the Meridian of Greenwich*, which gives the ephemerides of the Sun and Moon, the geocentric and heliocentric positions of the major planets, the Sun's co-ordinates, and other fundamental astronomical data for equidistant intervals of Greenwich mean time.

Part II, *Ephemeris for the Meridian of Washington*, which gives the ephemerides for the fixed stars, Sun, Moon, and major planets for transit over the meridian of the new Naval Observatory, Washington. The mean places of the fixed stars and the data for their reduction are also included in this part.

Part III, *Phenomena*, which contains predictions of phenomena to be observed, with data for their computation. Washington mean time for the meridian of the new Naval Observatory is used throughout this part except in a few cases, notably those of eclipses, where Greenwich mean time seems more convenient.

Part IV, *Star numbers, apparent places of stars, and other data based on the Constants of the Paris Conference of 1896*, which gives precession, obliquity, etc., Besselian star-numbers, independent star-numbers, ephemerides of four northern and one southern circumpolar stars, and ephemerides of twenty-five other stars whose apparent places differ from those given in Part II.

STIMSON J. BROWN,  
*Professor of Mathematics, U. S. Navy,*  
*Director Nautical Almanac.*

WASHINGTON, February, 1901.



# CONTENTS.

Corrections . . . . .	Page vi
Chronological Eras and Cycles . . . . .	vii
Symbols and Abbreviations . . . . .	viii
<b>PART I—EPHEMERIS FOR THE MERIDIAN OF GREENWICH.</b>	
Ephemeris of the Sun . . . . .	I-III
Ephemeris of the Moon . . . . .	IV-XII
Phases of the Moon . . . . .	XII
Lunar Distances . . . . .	XIII-XVIII
Pages of Each Month	
Geocentric Ephemerides of the Planets Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune . . . . .	218
Heliocentric Ephemerides of the Planets Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune . . . . .	250
Sun's Co-ordinates . . . . .	272
Moon's Longitude and Latitude . . . . .	280
Moon's Equator, Mean Longitude, etc. . . . .	284
Moon's Libration; Sun's Aberration and Horizontal Parallax . . . . .	285
Precession, Nutation, Obliquity, etc. . . . .	286
Nutation, Terms of Short Period in the . . . . .	287
<b>PART II—EPHEMERIS FOR THE MERIDIAN OF WASHINGTON.</b>	
BESSEL's Formulæ for Star-Reductions, Constants of <i>Struve and Peters</i> . . . . .	290
Besselian and Independent Star-Numbers, " " " " . . . . .	291
Besselian and Independent Star-Numbers, exclusive of short period terms, for every tenth sidereal day . . . . .	303
Mean Places of Standard Stars for 1904.0 . . . . .	304
Apparent Places of Five Circumpolar Stars . . . . .	312
Apparent Places of remaining Standard Stars . . . . .	324
Solar Ephemeris . . . . .	400
Moon-Culminations . . . . .	408
Transit-Ephemerides of the Planets Mercury, Venus, Jupiter, Saturn, Uranus, Neptune . . . . .	416
<b>PART III—PHENOMENA.</b>	
Eclipses . . . . .	435
Moon's Phases, Apogee, Perigee, and Greatest Libration . . . . .	440
Mean Places of Stars Occulted by the Moon . . . . .	441
Elements for the Prediction of Occultations . . . . .	445
Occultations Visible at Washington . . . . .	478
Disks of Mercury, Venus, and Mars . . . . .	480
Satellites of Jupiter, Saturn, Uranus, and Neptune . . . . .	483
Phenomena, Planetary Configurations . . . . .	514
Positions of Observatories . . . . .	516
<b>PART IV—APPARENT PLACES OF STARS, STAR-NUMBERS, ETC., BASED ON THE CONSTANTS OF THE PARIS CONFERENCE.</b>	
BESSEL's Formulæ for Star-Reductions . . . . .	522
Precession, Nutation, Obliquity, etc. . . . .	523
Besselian and Independent Star-Numbers . . . . .	524
Apparent Places of Five Circumpolar Stars . . . . .	536
Apparent Places of Twenty Five Standard Stars . . . . .	548
On the Arrangement and Use of <i>The American Ephemeris and Nautical Almanac</i> . . . . .	553
<b>APPENDIX.</b>	
On the Construction of <i>The American Ephemeris and Nautical Almanac</i> for 1904 . . . . .	579
<b>TABLES.</b>	
Table I.—Correction of Lunar Distances for Second Differences in Moon's Motion . . . . .	584
Table II.—Reduction of Sidereal to Mean Solar Time . . . . .	585
Table III.—Reduction of Mean Solar to Sidereal Time . . . . .	588
Table IV.—Latitude by Observation of the Altitude of Polaris . . . . .	591

# CORRECTIONS.

## *Ephemeris, 1902.*

Page.

381.	Second Star	for $\tau$ Aquilæ	read $\iota$ Aquilæ.
411.	Sixth column, heading	for s	read "
474.	May 18 and 19	for 18 and 19	read 17 and 18

## *Ephemeris, 1903. (First edition only.)*

305.	Third line from bottom	for $\delta$ Draconis	read $\delta$ Doradus.
366.	$\eta$ Bootis, Dec. 25 and 35	for 6.05 .31 6.39 .34	read 6.04 .30 6.36 .32
377.	$\theta$ Ophiuchi	for 17 <sup>h</sup> 15 <sup>m</sup>	read 17 <sup>h</sup> 16 <sup>m</sup>
386.	$\kappa$ Cephei (pr.)	for — 77 25	read — 77 25

509. } Elongations of Mimas and Tethys.  
510. }

By reason of the error of Hall's elements, — 4<sup>h</sup>.9 should be added to the times of elongations of Mimas, and + 0<sup>h</sup>.9 to those of Tethys, to make them conform with the elements of H. Struve.

575.	Second column, 20th line	for — 11.18	read + 11.18
And corrected value of $\tau$ will give on page 576, correct results as follows—			
576.	Albany Mean Time, June 15	for 13 <sup>h</sup> 31 <sup>m</sup> .9 14 <sup>h</sup> 35 <sup>m</sup> .2	read 13 <sup>h</sup> 53 <sup>m</sup> .9 14 <sup>h</sup> 58 <sup>m</sup> .7
	Angle of Position, $P$	for 27° 45' 288° 15'	read 29° 9' 287° 23'

583. Second line, after "Appendix I," insert—

"In the case of the elongations of Mimas and Tethys, however, corrections have been applied to make them conform with the elements of Prof. H. Struve, in *Beobachtungen der Saturnstrabanten*, St. Petersburg, 1898."

## *Ephemeris, 1904. (In some copies.)*

vii.	Dominical Letter	for C	read C B
203.	Last line, seventh column	for 21 <sup>h</sup> 8 <sup>m</sup> .5	read 21 <sup>h</sup> 8 <sup>m</sup> .0
439.	Limits,	for +8° 40'.4 162° 47'.8 E +7° 5'.4 162° 51'.4 E —25° 49'.3 69° 48'.7 W	read +8° 41'.0 162° 47'.7 E +7° 4'.9 162° 51'.5 E —25° 49'.7 69° 48'.9 W

583. Second line, after "Appendix I," insert—

"In the case of the elongations of Mimas and Tethys, however, corrections have been applied to make them conform with the elements of Prof. H. Struve, in *Beobachtungen der Saturnstrabanten*, St. Petersburg, 1898."



# CHRONOLOGICAL ERAS AND CYCLES.

## CHRONOLOGICAL ERAS.

THE YEAR 1904, WHICH COMPRISES THE LATTER PART OF THE 128TH AND THE BEGINNING OF THE 129TH YEAR OF THE INDEPENDENCE OF THE UNITED STATES OF AMERICA, CORRESPONDS TO—

The year 6617 of the Julian Period;

“ 7412-7413 of the Byzantine era, the year 7413 commencing on September 1;

“ 5664-5665 of the Jewish era, the year 5665 commencing on September 10, or, more exactly, at sunset on September 9;

“ 2657 since the foundation of Rome, according to VARRO;

“ 2651 since the beginning of the era of NABONASSAR, which has been assigned to Wednesday, the 26th of February of the 3967th year of the Julian Period; corresponding, in the notation of chronologists, to the 747th, and, in the notation of astronomers, to the 746th year before the birth of CHRIST;

“ 2580 of the Olympiads, or the fourth year of the 670th Olympiad, commencing in July, 1904, if we fix the era of the Olympiads at  $775\frac{1}{2}$  years before CHRIST, or near the beginning of July of the year 3938 of the Julian Period;

“ 2216 of the Grecian era, or the era of the SELEUCIDÆ, which began near the vernal equinox of the year, — 311 = B. C. 312, = 4402 of the Julian Period;

“ 1620 of the era of DIOCLETIAN;

“ 2564 of the Japanese era and to the 37th year of the period entitled “Meiji.”

The year 1322 of the Mohammedan era, or the era of the Hegira, begins on the 18th day of March, 1904.

The first day of January of the year 1904 is the 2,416,481st day since the commencement of the Julian Period.

## CHRONOLOGICAL CYCLES.

Dominical Letter . . . . .	C B	Solar Cycle . . . . .	9
Epact . . . . .	13	Roman Indiction . . . . .	2
Lunar Cycle or Golden Number . . . . .	5	Julian Period . . . . .	6617

# SYMBOLS AND ABBREVIATIONS.

## SIGNS OF THE PLANETS, ETC.

☉	The Sun.	♂	Mars.
☾	The Moon.	♃	Jupiter.
☿	Mercury.	♄	Saturn.
♀	Venus.	♅	Uranus.
♁	The Earth.	♆	Neptune.

## SIGNS OF THE ZODIAC.

Spring Signs.	{	1.	♈	Aries.	Autumn Signs.	{	7.	♎	Libra.
		2.	♉	Taurus.			8.	♏	Scorpius.
		3.	♊	Gemini.			9.	♐	Sagittarius.
Summer Signs.	{	4.	♋	Cancer.	Winter Signs.	{	10.	♑	Capricornus.
		5.	♌	Leo.			11.	♒	Aquarius.
		6.	♍	Virgo.			12.	♓	Pisces.

## ASPECTS.

- ♌ Conjunction, or having the same Longitude or Right Ascension.
- ☐ Quadrature, or differing  $\pm 90^\circ$  in Longitude or Right Ascension.
- ♌ Opposition, or differing  $180^\circ$  in Longitude or Right Ascension.

## ABBREVIATIONS.

♊ Ascending Node.	° Degrees.
♋ Descending Node.	' Minutes of Arc.
N. North.	" Seconds of Arc.
S. South.	h Hours.
E. East.	m Minutes of Time.
W. West.	s Seconds of Time.

PART I

---

ASTRONOMICAL EPHEMERIS

FOR THE

MERIDIAN OF GREENWICH.

## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S						Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.		Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.					
		h m s	s	° ' "	"	"	"	s	m s	s	
Frid.	1	18 42 4.91	11.053	S. 23 5 47.7	+ 11.10	16 17.90	71.08	3 11.10	1.193		
Sat.	2	18 46 30.02	11.039	23 1 7.3	12.26	16 17.91	71.05	3 39.58	1.179		
SUN.	3	18 50 54.79	11.025	22 55 59.3	13.41	16 17.91	71.01	4 7.72	1.165		
Mon.	4	18 55 19.22	11.010	22 50 23.8	+ 14.55	16 17.90	70.96	4 35.53	1.150		
Tues.	5	18 59 43.27	10.994	22 44 21.1	15.68	16 17.89	70.91	5 2.93	1.134		
Wed.	6	19 4 6.92	10.977	22 37 51.3	16.80	16 17.87	70.85	5 29.95	1.117		
Thur.	7	19 8 30.15	10.959	22 30 54.6	+ 17.92	16 17.85	70.79	5 56.55	1.099		
Frid.	8	19 12 52.93	10.939	22 23 31.1	19.03	16 17.82	70.72	6 22.70	1.080		
Sat.	9	19 17 15.24	10.919	22 15 41.2	20.13	16 17.78	70.65	6 48.39	1.060		
SUN.	10	19 21 37.05	10.898	22 7 25.0	+ 21.22	16 17.74	70.58	7 13.57	1.038		
Mon.	11	19 25 58.33	10.875	21 58 42.8	22.30	16 17.70	70.50	7 38.23	1.016		
Tues.	12	19 30 19.06	10.852	21 49 34.8	23.36	16 17.65	70.42	8 2.34	0.993		
Wed.	13	19 34 39.22	10.828	21 40 1.3	+ 24.42	16 17.60	70.34	8 25.88	0.968		
Thur.	14	19 38 58.78	10.802	21 30 2.6	25.46	16 17.54	70.26	8 48.81	0.942		
Frid.	15	19 43 17.70	10.775	21 19 39.0	26.50	16 17.47	70.17	9 11.12	0.916		
Sat.	16	19 47 35.98	10.747	21 8 50.7	+ 27.52	16 17.40	70.08	9 32.79	0.888		
SUN.	17	19 51 53.59	10.719	20 57 38.2	28.52	16 17.33	69.98	9 53.78	0.860		
Mon.	18	19 56 10.51	10.690	20 46 1.7	29.52	16 17.26	69.88	10 14.08	0.831		
Tues.	19	20 0 26.71	10.660	20 34 1.4	+ 30.50	16 17.18	69.78	10 33.68	0.801		
Wed.	20	20 4 42.18	10.629	20 21 37.9	31.46	16 17.10	69.68	10 52.55	0.770		
Thur.	21	20 8 56.90	10.597	20 8 51.4	32.41	16 17.01	69.58	11 10.66	0.739		
Frid.	22	20 13 10.86	10.565	19 55 42.4	+ 33.34	16 16.92	69.48	11 28.01	0.707		
Sat.	23	20 17 24.03	10.532	19 42 11.0	34.26	16 16.83	69.37	11 44.58	0.674		
SUN.	24	20 21 36.41	10.499	19 28 17.8	35.17	16 16.73	69.27	12 0.36	0.641		
Mon.	25	20 25 47.98	10.465	19 14 3.0	+ 36.06	16 16.63	69.16	12 15.33	0.607		
Tues.	26	20 29 58.75	10.431	18 59 27.1	36.93	16 16.52	69.05	12 29.50	0.573		
Wed.	27	20 34 8.69	10.397	18 44 30.4	37.79	16 16.41	68.94	12 42.85	0.539		
Thur.	28	20 38 17.80	10.362	18 29 13.3	+ 38.63	16 16.30	68.83	12 55.38	0.505		
Frid.	29	20 42 26.08	10.327	18 13 36.2	39.45	16 16.18	68.72	13 7.07	0.470		
Sat.	30	20 46 33.52	10.293	17 57 39.5	40.26	16 16.06	68.60	13 17.94	0.435		
SUN.	31	20 50 40.14	10.258	17 41 23.5	41.06	16 15.92	68.48	13 27.96	0.400		
Mon.	32	20 54 45.92	10.224	S. 17 24 48.7	+ 41.84	16 15.78	68.36	13 37.16	0.366		

**NOTE.**—The mean time of semidiameter passing the meridian may be found by subtracting 0°.17 from the sidereal time.  
The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

## AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour	Apparent Declination	Diff. for 1 Hour.			
		h m s	s	° ' "	"	m s	s	h m s
Frid.	1	18 42 4.32	11.049	S. 23 5 48.3	+ 11.10	3 11.04	1.193	18 38 53.28
Sat.	2	18 46 29.34	11.036	23 1 8.0	12.25	3 39.51	1.179	18 42 49.83
SUN.	3	18 50 54.03	11.022	22 56 0.2	13.40	4 7.64	1.165	18 46 46.39
Mon.	4	18 55 18.37	11.007	22 50 24.9	+ 14.54	4 35.42	1.150	18 50 42.95
Tues.	5	18 59 42.34	10.991	22 44 22.4	15.67	5 2.83	1.134	18 54 39.51
Wed.	6	19 4 5.91	10.974	22 37 52.8	16.79	5 29.85	1.117	18 58 36.06
Thur.	7	19 8 29.06	10.955	22 30 56.4	+ 17.91	5 56.44	1.099	19 2 32.62
Frid.	8	19 12 51.77	10.936	22 23 33.2	19.02	6 22.59	1.080	19 6 29.18
Sat.	9	19 17 14.00	10.916	22 15 43.5	20.12	6 48.27	1.060	19 10 25.73
SUN.	10	19 21 35.74	10.895	22 7 27.5	+ 21.21	7 13.45	1.038	19 14 22.29
Mon.	11	19 25 56.95	10.872	21 58 45.6	22.29	7 38.10	1.016	19 18 18.85
Tues.	12	19 30 17.61	10.849	21 49 37.9	23.35	8 2.21	0.992	19 22 15.40
Wed.	13	19 34 37.70	10.825	21 40 4.7	+ 24.41	8 25.74	0.968	19 26 11.96
Thur.	14	19 38 57.19	10.799	21 30 6.3	25.45	8 48.67	0.942	19 30 8.52
Frid.	15	19 43 16.06	10.773	21 19 43.0	26.48	9 10.98	0.916	19 34 5.07
Sat.	16	19 47 34.28	10.745	21 8 55.1	+ 27.50	9 32.65	0.889	19 38 1.63
SUN.	17	19 51 51.83	10.717	20 57 42.9	28.51	9 53.64	0.860	19 41 58.19
Mon.	18	19 56 8.69	10.688	20 46 6.7	29.50	10 13.94	0.831	19 45 54.74
Tues.	19	20 0 24.83	10.658	20 34 6.8	+ 30.48	10 33.54	0.802	19 49 51.30
Wed.	20	20 4 40.25	10.627	20 21 43.6	31.45	10 52.41	0.771	19 53 47.85
Thur.	21	20 8 54.93	10.596	20 8 57.5	32.40	11 10.52	0.739	19 57 44.41
Frid.	22	20 13 8.84	10.563	19 55 48.7	+ 33.33	11 27.87	0.707	20 1 40.97
Sat.	23	20 17 21.97	10.531	19 42 17.7	34.25	11 44.45	0.674	20 5 37.52
SUN.	24	20 21 34.31	10.497	19 28 24.8	35.16	12 0.23	0.641	20 9 34.08
Mon.	25	20 25 45.85	10.464	19 14 10.3	+ 36.05	12 15.21	0.607	20 13 30.63
Tues.	26	20 29 56.58	10.430	18 59 34.8	36.92	12 29.38	0.574	20 17 27.19
Wed.	27	20 34 6.48	10.396	18 44 38.4	37.78	12 42.74	0.540	20 21 23.74
Thur.	28	20 38 15.57	10.362	18 29 21.6	+ 38.62	12 55.27	0.505	20 25 20.30
Frid.	29	20 42 23.82	10.327	18 13 44.8	39.44	13 6.97	0.470	20 29 16.85
Sat.	30	20 46 31.24	10.292	17 57 48.4	40.25	13 17.84	0.435	20 33 13.41
SUN.	31	20 50 37.84	10.257	17 41 32.7	41.05	13 27.87	0.401	20 37 9.97
Mon.	32	20 54 43.60	10.223	S. 17 24 58.2	+ 41.83	13 37.08	0.367	20 41 6.52

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.  
 The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

Diff. for 1 Hour.  
 +9°.8565.  
 (Table III.)

AT GREENWICH MEAN NOON.									
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.	
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.				
		$\lambda$	$\lambda'$						
		$^{\circ}$ $'$ $''$	$^{\circ}$ $'$ $''$	$''$	$''$			$^h$ $^m$ $^s$	
1	1	279 40 20.2	40 19.2	152.85	— 0.33	9.992 6540	— 2.0	5 20 14.12	
2	2	280 41 28.5	41 27.4	152.85	0.35	9.992 6505	— 0.8	5 16 18.21	
3	3	281 42 36.8	42 35.5	152.85	0.34	9.992 6500	+ 0.4	5 12 22.29	
4	4	282 43 45.1	43 43.7	152.85	— 0.30	9.992 6524	+ 1.6	5 8 26.38	
5	5	283 44 53.5	44 51.9	152.85	0.22	9.992 6577	2.8	5 4 30.47	
6	6	284 46 1.9	46 0.2	152.85	0.13	9.992 6659	4.0	5 0 34.56	
7	7	285 47 10.5	47 8.6	152.86	— 0.02	9.992 6769	+ 5.1	4 56 38.65	
8	8	286 48 19.2	48 17.1	152.86	+ 0.10	9.992 6904	6.2	4 52 42.74	
9	9	287 49 27.9	49 25.7	152.87	0.23	9.992 7064	7.2	4 48 46.83	
10	10	288 50 36.7	50 34.3	152.87	+ 0.35	9.992 7247	+ 8.1	4 44 50.92	
11	11	289 51 45.6	51 43.0	152.87	0.46	9.992 7452	9.0	4 40 55.01	
12	12	290 52 54.4	52 51.7	152.87	0.55	9.992 7678	9.8	4 36 59.09	
13	13	291 54 3.1	54 0.3	152.86	+ 0.61	9.992 7922	+ 10.6	4 33 3.18	
14	14	292 55 11.6	55 8.6	152.85	0.65	9.992 8184	11.3	4 29 7.27	
15	15	293 56 19.9	56 16.7	152.84	0.66	9.992 8464	12.0	4 25 11.36	
16	16	294 57 27.8	57 24.4	152.82	+ 0.64	9.992 8761	+ 12.7	4 21 15.45	
17	17	295 58 35.3	58 31.8	152.80	0.60	9.992 9074	13.4	4 17 19.54	
18	18	296 59 42.2	59 38.5	152.78	0.53	9.992 9404	14.1	4 13 23.63	
19	19	298 0 48.5	0 44.6	152.75	+ 0.44	9.992 9750	+ 14.8	4 9 27.72	
20	20	299 1 54.0	1 50.1	152.72	0.33	9.993 0113	15.5	4 5 31.81	
21	21	300 2 58.8	2 54.7	152.68	0.22	9.993 0493	16.2	4 1 35.90	
22	22	301 4 2.8	3 58.5	152.64	+ 0.08	9.993 0890	+ 16.9	3 57 39.99	
23	23	302 5 5.8	5 1.4	152.60	— 0.05	9.993 1305	17.7	3 53 44.08	
24	24	303 6 7.8	6 3.3	152.56	0.18	9.993 1738	18.5	3 49 48.17	
25	25	304 7 8.7	7 4.1	152.52	— 0.30	9.993 2191	+ 19.3	3 45 52.26	
26	26	305 8 8.6	8 3.8	152.47	0.41	9.993 2663	20.1	3 41 56.35	
27	27	306 9 7.3	9 2.3	152.42	0.49	9.993 3157	21.0	3 38 0.44	
28	28	307 10 4.7	9 59.7	152.37	— 0.54	9.993 3674	+ 22.0	3 34 4.53	
29	29	308 11 1.0	10 55.8	152.32	0.57	9.993 4215	23.0	3 30 8.63	
30	30	309 11 56.1	11 50.8	152.27	0.56	9.993 4780	24.1	3 26 12.72	
31	31	310 12 50.1	12 44.6	152.22	0.53	9.993 5371	25.2	3 22 16.81	
32	32	311 13 42.9	13 37.2	152.18	— 0.46	9.993 5989	+ 26.3	3 18 20.90	

NOTE.—The longitudes in the column  $\lambda$  are referred to the true equinox of their own date, while those in the column  $\lambda'$  are referred to the mean equinox of the beginning of the Besselian fictitious year.

Diff. for 1 Hour,  
— 9<sup>s</sup>.8296.  
(Table II.)

## GREENWICH MEAN TIME.

## THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	' "	' "	' "	"	' "	"	h m	m	d
1	16 17.6	16 23.6	59 41.8	+ 1.97	60 4.2	+ 1.73	10 46.7	2.49	13.6
2	16 28.9	16 33.1	60 23.5	1.45	60 39.1	1.13	11 47.5	2.55	14.6
3	16 36.2	16 38.1	60 50.5	0.77	60 57.5	+ 0.39	12 48.8	2.54	15.6
4	16 38.8	16 38.3	61 0.0	+ 0.02	60 57.9	- 0.35	13 49.0	2.46	16.6
5	16 36.5	16 33.7	60 51.5	- 0.70	60 41.1	1.01	14 46.9	2.36	17.6
6	16 29.9	16 25.3	60 27.1	1.29	60 10.2	1.51	15 42.1	2.25	18.6
7	16 20.0	16 14.3	59 50.9	- 1.69	59 29.7	- 1.82	16 34.9	2.16	19.6
8	16 8.1	16 1.8	59 7.3	1.90	58 44.2	1.93	17 25.9	2.10	20.6
9	15 55.5	15 49.2	58 20.8	1.94	57 57.6	1.91	18 15.8	2.07	21.6
10	15 43.0	15 37.0	57 34.9	- 1.85	57 13.0	- 1.78	19 5.1	2.06	22.6
11	15 31.3	15 25.9	56 52.1	1.70	56 32.3	1.60	19 54.4	2.06	23.6
12	15 20.9	15 16.1	56 13.7	1.50	55 56.3	1.39	20 43.9	2.06	24.6
13	15 11.8	15 7.7	55 40.2	- 1.29	55 25.4	- 1.19	21 33.4	2.06	25.6
14	15 4.0	15 0.6	55 11.7	1.09	54 59.2	0.99	22 22.8	2.05	26.6
15	14 57.5	14 54.7	54 47.9	0.90	54 37.7	0.80	23 11.5	2.01	27.6
16	14 52.3	14 50.0	54 28.6	- 0.71	54 20.6	- 0.62	23 59.2	1.96	28.6
17	14 48.2	14 46.6	54 13.6	0.53	54 7.8	0.43	0		29.6
18	14 45.3	14 44.4	54 3.2	0.33	53 59.9	- 0.22	0 45.6	1.90	0.8
19	14 43.9	14 43.7	53 57.8	- 0.11	53 57.2	+ 0.01	1 30.6	1.85	1.8
20	14 44.0	14 44.7	53 58.1	+ 0.15	54 0.7	0.29	2 14.4	1.80	2.8
21	14 45.8	14 47.5	54 5.1	0.44	54 11.3	0.60	2 57.3	1.78	3.8
22	14 49.8	14 52.6	54 19.6	+ 0.78	54 29.9	+ 0.95	3 39.9	1.78	4.8
23	14 56.0	15 0.0	54 42.4	1.14	54 57.2	1.33	4 22.8	1.81	5.8
24	15 4.7	15 10.0	55 14.3	1.51	55 33.6	1.70	5 6.8	1.87	6.8
25	15 15.8	15 22.2	55 55.1	+ 1.88	56 18.6	+ 2.04	5 52.7	1.96	7.8
26	15 29.2	15 36.5	56 44.1	2.19	57 11.1	2.30	6 41.1	2.09	8.8
27	15 44.2	15 52.2	57 39.5	2.40	58 8.6	2.45	7 32.9	2.23	9.8
28	16 0.2	16 8.2	58 38.2	+ 2.44	59 7.4	+ 2.39	8 28.1	2.37	10.8
29	16 15.9	16 23.1	59 35.7	2.29	60 2.3	2.11	9 26.4	2.48	11.8
30	16 29.7	16 35.4	60 26.4	1.88	60 47.4	1.59	10 26.9	2.54	12.8
31	16 40.1	16 43.5	61 4.6	1.24	61 17.3	+ 0.85	11 28.0	2.53	13.8
32	16 45.7	16 46.4	61 25.1	+ 0.43	61 27.8	0.00	12 28.3	2.47	14.8

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 1.					SUNDAY 3.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
1	4 59 59.79	2.5803	N.17 52 46.0	2.878	1	7 4 14.45	2.6170	N.17 44 15.9	3.343
2	5 2 31.14	2.5246	17 55 35.1	2.759	2	7 6 51.45	2.6164	17 40 51.4	3.473
3	5 5 2.74	2.5287	17 58 17.1	2.641	3	7 9 28.42	2.6157	17 37 19.1	3.603
4	5 7 34.59	2.5328	18 0 52.0	2.521	4	7 12 5.34	2.6149	17 33 39.0	3.733
5	5 10 6.68	2.5368	18 3 19.6	2.400	5	7 14 42.21	2.6140	17 29 51.1	3.862
6	5 12 39.01	2.5408	18 5 40.0	2.279	6	7 17 19.02	2.6130	17 25 55.5	3.992
7	5 15 11.58	2.5447	18 7 53.1	2.157	7	7 19 55.77	2.6119	17 21 52.1	4.120
8	5 17 44.37	2.5484	18 9 58.8	2.033	8	7 22 32.45	2.6107	17 17 41.1	4.247
9	5 20 17.39	2.5524	18 11 57.1	1.910	9	7 25 9.05	2.6093	17 13 22.5	4.374
10	5 22 50.63	2.5558	18 13 48.0	1.786	10	7 27 45.57	2.6079	17 8 56.2	4.501
11	5 25 24.08	2.5593	18 15 31.4	1.660	11	7 30 22.00	2.6064	17 4 22.4	4.626
12	5 27 57.74	2.5627	18 17 7.2	1.534	12	7 32 58.34	2.6048	16 59 41.1	4.751
13	5 30 31.60	2.5660	18 18 35.5	1.408	13	7 35 34.58	2.6032	16 54 52.3	4.876
14	5 33 5.66	2.5693	18 19 56.2	1.282	14	7 38 10.72	2.6013	16 49 56.0	4.999
15	5 35 39.91	2.5724	18 21 9.3	1.154	15	7 40 46.74	2.5994	16 44 52.4	5.122
16	5 38 14.35	2.5755	18 22 14.7	1.026	16	7 43 22.65	2.5975	16 39 41.4	5.244
17	5 40 48.97	2.5784	18 23 12.4	0.897	17	7 45 58.44	2.5954	16 34 23.1	5.365
18	5 43 23.76	2.5813	18 24 2.3	0.768	18	7 48 34.10	2.5933	16 28 57.6	5.485
19	5 45 58.72	2.5840	18 24 44.5	0.638	19	7 51 9.64	2.5911	16 23 24.9	5.605
20	5 48 33.84	2.5867	18 25 18.9	0.508	20	7 53 45.03	2.5887	16 17 45.0	5.723
21	5 51 9.12	2.5893	18 25 45.5	0.377	21	7 56 20.28	2.5863	16 11 58.1	5.841
22	5 53 44.55	2.5918	18 26 4.2	0.247	22	7 58 55.39	2.5838	16 6 4.1	5.958
23	5 56 20.13	2.5941	18 26 15.1	+ 0.115	23	8 1 30.34	2.5812	16 0 3.2	6.073
	5 58 55.84	2.5963	N.18 26 18.0	- 0.018		8 4 5.14	2.5786	N.15 53 55.4	6.187
SATURDAY 2.					MONDAY 4.				
0	6 1 31.68	2.5984	N.18 26 13.0	0.149	0	8 6 39.77	2.5758	N.15 47 40.8	6.301
1	6 4 7.65	2.6005	18 26 0.1	0.281	1	8 9 14.24	2.5731	15 41 19.3	6.414
2	6 6 43.74	2.6024	18 25 39.3	0.413	2	8 11 48.54	2.5703	15 34 51.1	6.525
3	6 9 19.94	2.6043	18 25 10.5	0.547	3	8 14 22.67	2.5673	15 28 16.3	6.635
4	6 11 56.25	2.6059	18 24 33.7	0.680	4	8 16 56.62	2.5643	15 21 34.9	6.745
5	6 14 32.65	2.6075	18 23 48.9	0.813	5	8 19 30.39	2.5612	15 14 46.9	6.853
6	6 17 9.15	2.6090	18 22 56.1	0.947	6	8 22 3.97	2.5581	15 7 52.5	6.960
7	6 19 45.73	2.6104	18 21 55.3	1.080	7	8 24 37.36	2.5549	15 0 51.7	7.067
8	6 22 22.40	2.6117	18 20 46.5	1.214	8	8 27 10.56	2.5517	14 53 44.5	7.172
9	6 24 59.14	2.6128	18 19 29.6	1.348	9	8 29 43.56	2.5483	14 46 31.1	7.274
10	6 27 35.94	2.6139	18 18 4.8	1.481	10	8 32 16.36	2.5450	14 39 11.6	7.377
11	6 30 12.81	2.6148	18 16 31.9	1.616	11	8 34 48.96	2.5415	14 31 45.9	7.478
12	6 32 49.72	2.6156	18 14 50.9	1.750	12	8 37 21.34	2.5380	14 24 14.2	7.577
13	6 35 26.68	2.6163	18 13 1.9	1.883	13	8 39 53.52	2.5345	14 16 36.6	7.677
14	6 38 3.68	2.6170	18 11 4.9	2.017	14	8 42 25.48	2.5309	14 8 53.0	7.774
15	6 40 40.72	2.6175	18 8 59.9	2.150	15	8 44 57.23	2.5273	14 1 3.7	7.869
16	6 43 17.78	2.6179	18 6 46.9	2.284	16	8 47 28.76	2.5237	13 53 8.7	7.964
17	6 45 54.87	2.6182	18 4 25.9	2.417	17	8 50 0.07	2.5200	13 45 8.0	8.058
18	6 48 31.96	2.6183	18 1 56.9	2.550	18	8 52 31.16	2.5162	13 37 1.7	8.151
19	6 51 9.06	2.6183	17 59 19.9	2.682	19	8 55 2.02	2.5123	13 28 49.9	8.242
20	6 53 46.16	2.6183	17 56 35.0	2.815	20	8 57 32.64	2.5085	13 20 32.7	8.331
21	6 56 23.26	2.6182	17 53 42.1	2.947	21	9 0 3.04	2.5047	13 12 10.2	8.419
22	6 59 0.34	2.6179	17 50 41.3	3.080	22	9 2 33.21	2.5008	13 3 42.4	8.506
23	7 1 37.41	2.6176	17 47 32.5	3.212	23	9 5 3.14	2.4968	12 55 9.5	8.591
24	7 4 14.45	2.6170	N.17 44 15.9	3.343	24	9 7 32.83	2.4929	N.12 46 31.5	8.675



## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 5.					THURSDAY 7.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	9 7 32.83	2.4929	N. 12 46 31.5	8.675	0	11 2 29.66	2.3004	N. 4 40 6.0	11.053
1	9 10 2.29	2.4889	12 37 48.5	8.758	1	11 4 47.58	2.2970	4 29 2.3	11.069
2	9 12 31.50	2.4848	12 29 0.5	8.840	2	11 7 5.30	2.2935	4 17 57.7	11.084
3	9 15 0.47	2.4808	12 20 7.7	8.920	3	11 9 22.80	2.2900	4 6 52.2	11.098
4	9 17 29.20	2.4768	12 11 10.1	8.998	4	11 11 40.10	2.2867	3 55 45.9	11.110
5	9 19 57.69	2.4728	12 2 7.9	9.075	5	11 13 57.20	2.2833	3 44 39.0	11.121
6	9 22 25.93	2.4687	11 53 1.1	9.151	6	11 16 14.10	2.2800	3 33 31.4	11.131
7	9 24 53.93	2.4646	11 43 49.8	9.225	7	11 18 30.80	2.2767	3 22 23.3	11.139
8	9 27 21.68	2.4604	11 34 34.1	9.298	8	11 20 47.30	2.2734	3 11 14.7	11.147
9	9 29 49.18	2.4563	11 25 14.0	9.370	9	11 23 3.61	2.2702	3 0 5.7	11.153
10	9 32 16.43	2.4521	11 15 49.7	9.439	10	11 25 19.73	2.2671	2 48 56.3	11.158
11	9 34 43.43	2.4478	11 6 21.3	9.508	11	11 27 35.66	2.2639	2 37 46.7	11.162
12	9 37 10.17	2.4437	10 56 48.8	9.575	12	11 29 51.40	2.2608	2 26 36.9	11.164
13	9 39 36.67	2.4396	10 47 12.3	9.641	13	11 32 6.96	2.2578	2 15 27.0	11.166
14	9 42 2.92	2.4354	10 37 31.9	9.704	14	11 34 22.34	2.2548	2 4 17.0	11.167
15	9 44 28.92	2.4312	10 27 47.8	9.767	15	11 36 37.54	2.2518	1 53 7.0	11.166
16	9 46 54.66	2.4270	10 17 59.9	9.829	16	11 38 52.56	2.2489	1 41 57.1	11.163
17	9 49 20.16	2.4229	10 8 8.3	9.889	17	11 41 7.41	2.2460	1 30 47.4	11.160
18	9 51 45.41	2.4187	9 58 13.2	9.948	18	11 43 22.08	2.2432	1 19 37.9	11.156
19	9 54 10.40	2.4145	9 48 14.6	10.005	19	11 45 36.59	2.2405	1 8 28.7	11.151
20	9 56 35.15	2.4103	9 38 12.6	10.060	20	11 47 50.94	2.2378	0 57 19.8	11.144
21	9 58 59.64	2.4061	9 28 7.4	10.114	21	11 50 5.12	2.2350	0 46 11.4	11.136
22	10 1 23.88	2.4020	9 17 58.9	10.167	22	11 52 19.14	2.2323	0 35 3.5	11.127
23	10 3 47.88	2.3978	N. 9 7 47.3	10.219	23	11 54 33.00	2.2297	N. 0 23 56.1	11.117
WEDNESDAY 6.					FRIDAY 8.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	10 6 11.62	2.3937	N. 8 57 32.6	10.269	0	11 56 46.70	2.2272	N. 0 12 49.4	11.107
1	10 8 35.12	2.3896	8 47 15.0	10.318	1	11 59 0.26	2.2247	N. 0 1 43.3	11.095
2	10 10 58.37	2.3854	8 36 54.5	10.364	2	12 1 13.66	2.2222	S. 0 9 22.0	11.082
3	10 13 21.37	2.3813	8 26 31.3	10.410	3	12 3 26.92	2.2198	0 20 26.5	11.068
4	10 15 44.13	2.3773	8 16 5.3	10.455	4	12 5 40.03	2.2173	0 31 30.2	11.053
5	10 18 6.64	2.3732	8 5 36.7	10.498	5	12 7 53.00	2.2150	0 42 32.9	11.037
6	10 20 28.91	2.3692	7 55 5.6	10.538	6	12 10 5.83	2.2127	0 53 34.6	11.020
7	10 22 50.94	2.3652	7 44 32.1	10.579	7	12 12 18.52	2.2104	1 4 35.3	11.002
8	10 25 12.73	2.3611	7 33 56.1	10.618	8	12 14 31.08	2.2083	1 15 34.8	10.983
9	10 27 34.27	2.3570	7 23 17.9	10.655	9	12 16 43.51	2.2061	1 26 33.2	10.963
10	10 29 55.57	2.3531	7 12 37.5	10.692	10	12 18 55.81	2.2040	1 37 30.4	10.943
11	10 32 16.64	2.3492	7 1 54.9	10.727	11	12 21 7.99	2.2020	1 48 26.3	10.920
12	10 34 37.47	2.3452	6 51 10.3	10.759	12	12 23 20.05	2.1999	1 59 20.8	10.897
13	10 36 58.07	2.3413	6 40 23.8	10.791	13	12 25 31.98	2.1979	2 10 13.9	10.873
14	10 39 18.43	2.3375	6 29 35.4	10.822	14	12 27 43.80	2.1960	2 21 5.6	10.849
15	10 41 38.57	2.3337	6 18 45.2	10.851	15	12 29 55.50	2.1940	2 31 55.8	10.823
16	10 43 58.47	2.3298	6 7 53.3	10.878	16	12 32 7.08	2.1922	2 42 44.3	10.795
17	10 46 18.15	2.3261	5 56 59.8	10.905	17	12 34 18.56	2.1904	2 53 31.2	10.768
18	10 48 37.60	2.3223	5 46 4.7	10.931	18	12 36 29.93	2.1887	3 4 16.5	10.741
19	10 50 56.83	2.3186	5 35 8.1	10.954	19	12 38 41.20	2.1869	3 15 0.1	10.711
20	10 53 15.83	2.3148	5 24 10.2	10.977	20	12 40 52.36	2.1853	3 25 41.8	10.680
21	10 55 34.61	2.3112	5 13 10.9	10.998	21	12 43 3.43	2.1837	3 36 21.7	10.649
22	10 57 53.18	2.3077	5 2 10.4	11.018	22	12 45 14.40	2.1820	3 46 59.7	10.617
23	11 0 11.53	2.3040	4 51 8.7	11.037	23	12 47 25.27	2.1804	3 57 35.7	10.583
24	11 2 29.66	2.3004	N. 4 40 6.0	11.053	24	12 49 36.05	2.1789	S. 4 8 9.7	10.550

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 9.					MONDAY 11.				
0	12 49 36.05	2.1789	S. 4 8 9.7	10.550	0	14 33 11.01	2.1494	S. 11 40 56.5	8.052
1	12 51 46.74	2.1775	4 18 41.7	10.515	1	14 35 19.98	2.1495	11 48 57.6	7.984
2	12 53 57.35	2.1761	4 29 11.5	10.479	2	14 37 28.95	2.1495	11 56 54.6	7.915
3	12 56 7.87	2.1748	4 39 39.2	10.443	3	14 39 37.92	2.1496	12 4 47.4	7.846
4	12 58 18.32	2.1734	4 50 4.7	10.406	4	14 41 46.90	2.1497	12 12 36.1	7.777
5	13 0 28.68	2.1721	5 0 27.9	10.368	5	14 43 55.89	2.1498	12 20 20.7	7.708
6	13 2 38.97	2.1708	5 10 48.9	10.329	6	14 46 4.88	2.1500	12 28 1.1	7.638
7	13 4 49.18	2.1696	5 21 7.4	10.289	7	14 48 13.89	2.1502	12 35 37.2	7.567
8	13 6 59.32	2.1684	5 31 23.6	10.249	8	14 50 22.91	2.1503	12 43 9.1	7.496
9	13 9 9.39	2.1673	5 41 37.3	10.208	9	14 52 31.93	2.1505	12 50 36.7	7.423
10	13 11 19.40	2.1663	5 51 48.5	10.166	10	14 54 40.97	2.1508	12 57 59.9	7.351
11	13 13 29.34	2.1652	6 1 57.2	10.123	11	14 56 50.02	2.1510	13 5 18.8	7.279
12	13 15 39.22	2.1642	6 12 3.2	10.078	12	14 58 59.09	2.1512	13 12 33.4	7.206
13	13 17 49.04	2.1632	6 22 6.6	10.035	13	15 1 8.17	2.1514	13 19 43.5	7.132
14	13 19 58.80	2.1623	6 32 7.4	9.990	14	15 3 17.26	2.1517	13 26 49.2	7.058
15	13 22 8.51	2.1613	6 42 5.4	9.944	15	15 5 26.37	2.1519	13 33 50.5	6.983
16	13 24 18.16	2.1604	6 52 0.7	9.898	16	15 7 35.49	2.1522	13 40 47.2	6.908
17	13 26 27.76	2.1597	7 1 53.1	9.850	17	15 9 44.63	2.1524	13 47 39.4	6.833
18	13 28 37.32	2.1589	7 11 42.7	9.802	18	15 11 53.78	2.1527	13 54 27.1	6.757
19	13 30 46.83	2.1581	7 21 29.4	9.753	19	15 14 2.95	2.1530	14 1 10.2	6.679
20	13 32 56.29	2.1573	7 31 13.1	9.704	20	15 16 12.14	2.1533	14 7 48.6	6.602
21	13 35 5.71	2.1567	7 40 53.9	9.654	21	15 18 21.34	2.1535	14 14 22.5	6.526
22	13 37 15.09	2.1561	7 50 31.6	9.603	22	15 20 30.56	2.1538	14 20 51.7	6.448
23	13 39 24.44	2.1555	S. 8 0 6.2	9.551	23	15 22 39.80	2.1541	S. 14 27 16.2	6.368
SUNDAY 10.					TUESDAY 12.				
0	13 41 33.75	2.1548	S. 8 9 37.7	9.499	0	15 24 49.05	2.1544	S. 14 33 35.9	6.290
1	13 43 43.02	2.1543	8 19 6.1	9.446	1	15 26 58.33	2.1548	14 39 51.0	6.212
2	13 45 52.26	2.1538	8 28 31.2	9.392	2	15 29 7.62	2.1550	14 46 1.3	6.132
3	13 48 1.48	2.1533	8 37 53.2	9.338	3	15 31 16.93	2.1553	14 52 6.9	6.052
4	13 50 10.66	2.1528	8 47 11.8	9.283	4	15 33 26.26	2.1557	14 58 7.6	5.972
5	13 52 19.82	2.1524	8 56 27.1	9.228	5	15 35 35.61	2.1559	15 4 3.5	5.892
6	13 54 28.95	2.1520	9 5 39.1	9.172	6	15 37 44.97	2.1562	15 9 54.6	5.811
7	13 56 38.06	2.1517	9 14 47.7	9.114	7	15 39 54.35	2.1565	15 15 40.8	5.730
8	13 58 47.15	2.1513	9 23 52.8	9.056	8	15 42 3.75	2.1568	15 21 22.2	5.648
9	14 0 56.22	2.1510	9 32 54.4	8.998	9	15 44 13.17	2.1572	15 26 58.6	5.566
10	14 3 5.27	2.1507	9 41 52.5	8.939	10	15 46 22.61	2.1574	15 32 30.1	5.483
11	14 5 14.31	2.1505	9 50 47.1	8.879	11	15 48 32.06	2.1577	15 37 56.6	5.400
12	14 7 23.33	2.1503	9 59 38.0	8.818	12	15 50 41.53	2.1579	15 43 18.1	5.317
13	14 9 32.34	2.1501	10 8 25.3	8.758	13	15 52 51.01	2.1582	15 48 34.7	5.235
14	14 11 41.34	2.1499	10 17 9.0	8.697	14	15 55 0.51	2.1584	15 53 46.3	5.151
15	14 13 50.33	2.1498	10 25 49.0	8.635	15	15 57 10.02	2.1586	15 58 52.8	5.067
16	14 15 59.31	2.1496	10 34 25.2	8.573	16	15 59 19.54	2.1588	16 3 54.3	4.983
17	14 18 8.28	2.1495	10 42 57.7	8.510	17	16 1 29.08	2.1591	16 8 50.7	4.898
18	14 20 17.25	2.1494	10 51 26.4	8.446	18	16 3 38.63	2.1593	16 13 42.1	4.813
19	14 22 26.21	2.1493	10 59 51.2	8.382	19	16 5 48.20	2.1595	16 18 28.3	4.728
20	14 24 35.17	2.1493	11 8 12.2	8.317	20	16 7 57.77	2.1597	16 23 9.4	4.643
21	14 26 44.13	2.1493	11 16 29.2	8.251	21	16 10 7.36	2.1599	16 27 45.4	4.557
22	14 28 53.09	2.1493	11 24 42.3	8.185	22	16 12 16.96	2.1601	16 32 16.2	4.471
23	14 31 2.05	2.1493	11 32 51.4	8.118	23	16 14 26.57	2.1603	16 36 41.9	4.384
24	14 33 11.01	2.1491	S. 11 40 56.5	8.052	24	16 16 36.19	2.1604	S. 16 41 2.3	4.298

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 13.					FRIDAY 15.				
0	h m s	s	S. ° ' "	"	0	h m s	s	S. ° ' "	"
0	16 16 36.19	2.1604	S. 16 41 2.3	4.198	0	18 0 5.27	2.1470	S. 18 24 40.3	0.003
1	16 18 45.82	2.1605	16 45 17.6	4.212	1	18 2 13.76	2.1499	18 24 37.4	0.093
2	16 20 55.45	2.1606	16 49 27.7	4.124	2	18 4 22.18	2.1528	18 24 29.1	0.183
3	16 23 5.09	2.1608	16 53 32.5	4.037	3	18 6 30.54	2.1588	18 24 15.5	0.272
4	16 25 14.74	2.1608	16 57 32.1	3.949	4	18 8 38.83	2.1576	18 23 56.5	0.361
5	16 27 24.39	2.1608	17 1 26.4	3.862	5	18 10 47.05	2.1564	18 23 32.2	0.449
6	16 29 34.04	2.1609	17 5 15.5	3.774	6	18 12 55.20	2.1553	18 23 2.6	0.538
7	16 31 43.70	2.1610	17 8 59.3	3.686	7	18 15 3.28	2.1541	18 22 27.6	0.628
8	16 33 53.36	2.1610	17 12 37.8	3.598	8	18 17 11.29	2.1528	18 21 47.3	0.716
9	16 36 3.02	2.1610	17 16 11.0	3.509	9	18 19 19.22	2.1516	18 21 1.7	0.804
10	16 38 12.68	2.1610	17 19 38.9	3.421	10	18 21 27.08	2.1503	18 20 10.8	0.892
11	16 40 22.34	2.1609	17 23 1.5	3.333	11	18 23 34.86	2.1490	18 19 14.7	0.980
12	16 42 31.99	2.1608	17 26 18.8	3.245	12	18 25 42.56	2.1477	18 18 13.2	1.068
13	16 44 41.64	2.1608	17 29 30.7	3.154	13	18 27 50.18	2.1463	18 17 6.5	1.155
14	16 46 51.28	2.1607	17 32 37.3	3.065	14	18 29 57.71	2.1448	18 15 54.6	1.242
15	16 49 0.92	2.1606	17 35 38.5	2.975	15	18 32 5.15	2.1433	18 14 37.5	1.328
16	16 51 10.55	2.1604	17 38 34.3	2.885	16	18 34 12.51	2.1419	18 13 15.2	1.415
17	16 53 20.17	2.1602	17 41 24.7	2.796	17	18 36 19.78	2.1405	18 11 47.7	1.502
18	16 55 29.78	2.1600	17 44 9.8	2.706	18	18 38 26.97	2.1390	18 10 15.0	1.588
19	16 57 39.37	2.1598	17 46 49.4	2.616	19	18 40 34.06	2.1373	18 8 37.2	1.673
20	16 59 48.95	2.1596	17 49 23.7	2.527	20	18 42 41.05	2.1358	18 6 54.3	1.758
21	17 1 58.52	2.1593	17 51 52.6	2.436	21	18 44 47.95	2.1343	18 5 6.2	1.844
22	17 4 8.07	2.1590	17 54 16.0	2.345	22	18 46 54.76	2.1327	18 3 13.0	1.929
23	17 6 17.60	2.1587	S. 17 56 34.0	2.255	23	18 49 1.47	2.1310	S. 18 1 14.7	2.014
THURSDAY 14.					SATURDAY 16.				
0	h m s	s	S. ° ' "	"	0	h m s	s	S. ° ' "	"
0	17 8 27.11	2.1583	S. 17 58 46.6	2.165	0	18 51 8.08	2.1093	S. 17 59 11.3	2.098
1	17 10 36.60	2.1580	18 0 53.8	2.075	1	18 53 14.59	2.1077	17 57 2.9	2.183
2	17 12 46.07	2.1576	18 2 55.6	1.984	2	18 55 21.00	2.1060	17 54 49.4	2.267
3	17 14 55.51	2.1572	18 4 51.9	1.893	3	18 57 27.31	2.1043	17 52 30.9	2.350
4	17 17 4.93	2.1567	18 6 42.8	1.803	4	18 59 33.51	2.1025	17 50 7.4	2.433
5	17 19 14.32	2.1563	18 8 28.3	1.713	5	19 1 39.61	2.1008	17 47 39.0	2.515
6	17 21 23.68	2.1558	18 10 8.3	1.622	6	19 3 45.60	2.0989	17 45 5.6	2.598
7	17 23 33.01	2.1553	18 11 42.9	1.532	7	19 5 51.48	2.0971	17 42 27.2	2.681
8	17 25 42.31	2.1547	18 13 12.1	1.441	8	19 7 57.25	2.0953	17 39 43.9	2.763
9	17 27 51.57	2.1541	18 14 35.8	1.350	9	19 10 2.91	2.0934	17 36 55.7	2.843
10	17 30 0.80	2.1535	18 15 54.1	1.259	10	19 12 8.46	2.0915	17 34 2.7	2.924
11	17 32 9.99	2.1528	18 17 6.9	1.168	11	19 14 13.89	2.0896	17 31 4.8	3.005
12	17 34 19.14	2.1522	18 18 14.2	1.077	12	19 16 19.21	2.0877	17 28 2.1	3.086
13	17 36 28.25	2.1514	18 19 16.2	0.987	13	19 18 24.41	2.0858	17 24 54.5	3.166
14	17 38 37.31	2.1507	18 20 12.7	0.897	14	19 20 29.50	2.0838	17 21 42.2	3.245
15	17 40 46.33	2.1500	18 21 3.8	0.807	15	19 22 34.47	2.0818	17 18 25.1	3.325
16	17 42 55.31	2.1493	18 21 49.5	0.717	16	19 24 39.32	2.0798	17 15 3.2	3.403
17	17 45 4.24	2.1484	18 22 29.8	0.627	17	19 26 44.05	2.0778	17 11 36.7	3.481
18	17 47 13.12	2.1476	18 23 4.7	0.536	18	19 28 48.66	2.0758	17 8 5.5	3.559
19	17 49 21.95	2.1468	18 23 34.1	0.446	19	19 30 53.15	2.0738	17 4 29.6	3.637
20	17 51 30.73	2.1458	18 23 58.2	0.356	20	19 32 57.52	2.0718	17 0 49.1	3.714
21	17 53 39.45	2.1448	18 24 16.8	0.265	21	19 35 1.76	2.0697	16 57 3.9	3.791
22	17 55 48.11	2.1439	18 24 30.0	0.175	22	19 37 5.88	2.0677	16 53 14.2	3.867
23	17 57 56.72	2.1430	18 24 37.8	-0.086	23	19 39 9.88	2.0655	16 49 19.9	3.942
24	18 0 5.27	2.1420	S. 18 24 40.3	+0.073	24	19 41 13.74	2.0633	S. 16 45 21.1	4.018

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 17.					TUESDAY 19.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	19 41 13.74	2.0633	S. 16 45 21.1	4.018	0	21 17 45.38	1.9594	S. 12 14 42.1	7.062
1	19 43 17.48	2.0613	16 41 17.7	4.093	1	21 19 42.89	1.9575	12 7 36.9	7.112
2	19 45 21.10	2.0593	16 37 9.9	4.168	2	21 21 40.28	1.9555	12 0 28.6	7.163
3	19 47 24.59	2.0570	16 32 57.6	4.243	3	21 23 37.55	1.9535	11 53 17.3	7.212
4	19 49 27.94	2.0548	16 28 40.8	4.316	4	21 25 34.70	1.9516	11 46 3.1	7.261
5	19 51 31.17	2.0527	16 24 19.7	4.388	5	21 27 31.74	1.9497	11 38 46.0	7.309
6	19 53 34.27	2.0506	16 19 54.2	4.462	6	21 29 28.67	1.9478	11 31 26.0	7.357
7	19 55 37.24	2.0484	16 15 24.3	4.533	7	21 31 25.48	1.9460	11 24 3.2	7.403
8	19 57 40.08	2.0463	16 10 50.2	4.605	8	21 33 22.19	1.9442	11 16 37.6	7.451
9	19 59 42.79	2.0441	16 6 11.7	4.677	9	21 35 18.78	1.9423	11 9 9.1	7.497
10	20 1 45.37	2.0419	16 1 28.9	4.748	10	21 37 15.26	1.9404	11 1 38.0	7.542
11	20 3 47.82	2.0397	15 56 41.9	4.817	11	21 39 11.63	1.9386	10 54 4.1	7.587
12	20 5 50.13	2.0374	15 51 50.8	4.888	12	21 41 7.89	1.9368	10 46 27.5	7.632
13	20 7 52.31	2.0353	15 46 55.4	4.958	13	21 43 4.05	1.9352	10 38 48.3	7.676
14	20 9 54.36	2.0331	15 41 55.9	5.026	14	21 45 0.11	1.9335	10 31 6.4	7.720
15	20 11 56.28	2.0308	15 36 52.3	5.095	15	21 46 56.07	1.9318	10 23 21.9	7.762
16	20 13 58.06	2.0286	15 31 44.5	5.163	16	21 48 51.92	1.9300	10 15 34.9	7.804
17	20 15 59.71	2.0264	15 26 32.7	5.230	17	21 50 47.67	1.9283	10 7 45.4	7.846
18	20 18 1.23	2.0242	15 21 16.9	5.297	18	21 52 43.32	1.9268	9 59 53.4	7.887
19	20 20 2.61	2.0218	15 15 57.1	5.363	19	21 54 38.88	1.9252	9 51 58.9	7.928
20	20 22 3.85	2.0197	15 10 33.3	5.429	20	21 56 34.34	1.9236	9 44 2.0	7.968
21	20 24 4.97	2.0175	15 5 5.6	5.494	21	21 58 29.71	1.9221	9 36 2.7	8.008
22	20 26 5.95	2.0152	14 59 34.0	5.559	22	22 0 24.99	1.9206	9 28 1.1	8.047
23	20 28 6.79	2.0128	S. 14 53 58.5	5.623	23	22 2 20.18	1.9192	S. 9 19 57.1	8.086
MONDAY 18.					WEDNESDAY 20.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	20 30 7.49	2.0107	S. 14 48 19.2	5.688	0	22 4 15.29	1.9177	S. 9 11 50.8	8.123
1	20 32 8.07	2.0085	14 42 36.0	5.752	1	22 6 10.30	1.9162	9 3 42.3	8.161
2	20 34 8.51	2.0063	14 36 49.0	5.814	2	22 8 5.23	1.9148	8 55 31.5	8.198
3	20 36 8.82	2.0041	14 30 58.3	5.876	3	22 10 0.08	1.9134	8 47 18.5	8.234
4	20 38 9.00	2.0019	14 25 3.9	5.938	4	22 11 54.84	1.9120	8 39 3.4	8.270
5	20 40 9.05	1.9997	14 19 5.7	6.000	5	22 13 49.52	1.9107	8 30 46.1	8.305
6	20 42 8.96	1.9974	14 13 3.9	6.060	6	22 15 44.13	1.9095	8 22 26.8	8.339
7	20 44 8.74	1.9953	14 6 58.5	6.120	7	22 17 38.66	1.9082	8 14 5.4	8.374
8	20 46 8.40	1.9932	14 0 49.5	6.180	8	22 19 33.11	1.9069	8 5 41.9	8.408
9	20 48 7.92	1.9909	13 54 36.9	6.239	9	22 21 27.49	1.9058	7 57 16.4	8.441
10	20 50 7.31	1.9887	13 48 20.8	6.298	10	22 23 21.81	1.9047	7 48 49.0	8.473
11	20 52 6.56	1.9865	13 42 1.1	6.357	11	22 25 16.05	1.9034	7 40 19.6	8.505
12	20 54 5.69	1.9844	13 35 38.0	6.413	12	22 27 10.22	1.9023	7 31 48.4	8.536
13	20 56 4.69	1.9823	13 29 11.5	6.470	13	22 29 4.33	1.9013	7 23 15.3	8.567
14	20 58 3.56	1.9802	13 22 41.6	6.527	14	22 30 58.38	1.9003	7 14 40.3	8.597
15	21 0 2.31	1.9781	13 16 8.3	6.583	15	22 32 52.37	1.8994	7 6 3.6	8.627
16	21 2 0.93	1.9759	13 9 31.6	6.639	16	22 34 46.30	1.8984	6 57 25.1	8.657
17	21 3 59.42	1.9738	13 2 51.6	6.693	17	22 36 40.18	1.8975	6 48 44.8	8.686
18	21 5 57.79	1.9718	12 56 8.4	6.747	18	22 38 34.00	1.8966	6 40 2.8	8.714
19	21 7 56.03	1.9696	12 49 22.0	6.801	19	22 40 27.77	1.8958	6 31 19.1	8.742
20	21 9 54.14	1.9676	12 42 32.3	6.855	20	22 42 21.49	1.8949	6 22 33.8	8.768
21	21 11 52.14	1.9656	12 35 39.4	6.908	21	22 44 15.16	1.8942	6 13 46.9	8.795
22	21 13 50.01	1.9635	12 28 43.4	6.959	22	22 46 8.79	1.8934	6 4 58.4	8.822
23	21 15 47.76	1.9614	12 21 44.3	7.011	23	22 48 2.37	1.8927	5 56 8.3	8.848
24	21 17 45.38	1.9594	S. 12 14 42.1	7.062	24	22 49 55.91	1.8920	S. 5 47 16.7	8.873

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 21.					SATURDAY 23.				
0	h m s		° ' "		0	h m s		° ' "	
0	22 49 55.91	1.8920	S. 5 47 16.7	8.873	0	0 20 46.03	1.9099	N. 1 37 20.6	9.447
1	22 51 49.41	1.8914	5 38 23.6	8.897	1	0 22 40.67	1.9114	1 46 47.4	9.446
2	22 53 42.88	1.8908	5 29 29.1	8.920	2	0 24 35.40	1.9129	1 56 14.1	9.444
3	22 55 36.31	1.8902	5 20 33.2	8.944	3	0 26 30.22	1.9146	2 5 40.7	9.442
4	22 57 29.71	1.8897	5 11 35.8	8.967	4	0 28 25.15	1.9163	2 15 7.1	9.438
5	22 59 23.08	1.8893	5 2 37.1	8.989	5	0 30 20.17	1.9179	2 24 33.3	9.435
6	23 1 16.42	1.8888	4 53 37.1	9.011	6	0 32 15.30	1.9197	2 33 59.3	9.431
7	23 3 9.74	1.8885	4 44 35.8	9.032	7	0 34 10.54	1.9215	2 43 25.0	9.426
8	23 5 3.04	1.8882	4 35 33.2	9.053	8	0 36 5.88	1.9233	2 52 50.4	9.420
9	23 6 56.32	1.8878	4 26 29.4	9.073	9	0 38 1.34	1.9253	3 2 15.4	9.414
10	23 8 49.58	1.8875	4 17 24.4	9.093	10	0 39 56.92	1.9273	3 11 40.1	9.408
11	23 10 42.82	1.8872	4 8 18.2	9.113	11	0 41 52.61	1.9293	3 21 4.4	9.401
12	23 12 36.04	1.8870	3 59 10.8	9.132	12	0 43 48.43	1.9313	3 30 28.2	9.393
13	23 14 29.26	1.8869	3 50 2.4	9.149	13	0 45 44.37	1.9334	3 39 51.5	9.384
14	23 16 22.47	1.8868	3 40 52.9	9.168	14	0 47 40.44	1.9356	3 49 14.3	9.376
15	23 18 15.68	1.8868	3 31 42.3	9.185	15	0 49 36.64	1.9378	3 58 36.6	9.367
16	23 20 8.88	1.8867	3 22 30.7	9.201	16	0 51 32.98	1.9401	4 7 58.3	9.356
17	23 22 2.08	1.8868	3 13 18.2	9.216	17	0 53 29.45	1.9423	4 17 19.3	9.345
18	23 23 55.29	1.8868	3 4 4.8	9.232	18	0 55 26.06	1.9447	4 26 39.7	9.333
19	23 25 48.50	1.8869	2 54 50.4	9.247	19	0 57 22.82	1.9472	4 35 59.3	9.322
20	23 27 41.72	1.8871	2 45 35.1	9.262	20	0 59 19.72	1.9496	4 45 18.3	9.309
21	23 29 34.95	1.8873	2 36 19.0	9.276	21	1 1 16.77	1.9522	4 54 36.4	9.295
22	23 31 28.19	1.8875	2 27 2.0	9.289	22	1 3 13.98	1.9548	5 3 53.7	9.282
23	23 33 21.45	1.8878	S. 2 17 14.3	9.302	23	1 5 11.34	1.9573	N. 5 13 10.2	9.268
FRIDAY 22.					SUNDAY 24.				
0	h m s		° ' "		0	h m s		° ' "	
0	23 35 14.73	1.888	S. 2 8 25.8	9.314	0	1 7 8.86	1.9600	N. 5 22 25.8	9.252
1	23 37 8.03	1.8885	1 59 6.6	9.326	1	1 9 6.54	1.9628	5 31 40.4	9.236
2	23 39 1.35	1.8889	1 49 46.7	9.337	2	1 11 4.39	1.9655	5 40 54.1	9.220
3	23 40 54.70	1.8894	1 40 26.1	9.348	3	1 13 2.40	1.9683	5 50 6.8	9.203
4	23 42 48.08	1.8899	1 31 4.9	9.358	4	1 15 0.59	1.9713	5 59 18.4	9.185
5	23 44 41.49	1.8904	1 21 43.1	9.367	5	1 16 58.95	1.9741	6 8 29.0	9.167
6	23 46 34.93	1.8911	1 12 20.8	9.377	6	1 18 57.48	1.9771	6 17 38.4	9.147
7	23 48 28.42	1.8917	1 2 57.9	9.386	7	1 20 56.20	1.9802	6 26 46.6	9.128
8	23 50 21.94	1.8923	0 53 34.5	9.393	8	1 22 55.10	1.9832	6 35 53.7	9.108
9	23 52 15.50	1.8931	0 44 10.7	9.401	9	1 24 54.18	1.9863	6 44 59.5	9.086
10	23 54 9.11	1.8939	0 34 46.4	9.408	10	1 26 53.45	1.9895	6 54 4.0	9.063
11	23 56 2.77	1.8948	0 25 21.7	9.414	11	1 28 52.92	1.9928	7 3 7.1	9.041
12	23 57 56.48	1.8956	0 15 56.7	9.420	12	1 30 52.58	1.9960	7 12 8.9	9.018
13	23 59 50.24	1.8965	S. 0 6 31.3	9.426	13	1 32 52.44	1.9993	7 21 9.3	8.994
14	0 1 44.06	1.8975	N. 0 2 54.4	9.431	14	1 34 52.50	2.0027	7 30 8.2	8.969
15	0 3 37.94	1.8985	0 12 20.4	9.435	15	1 36 52.76	2.0061	7 39 5.6	8.944
16	0 5 31.88	1.8996	0 21 46.6	9.438	16	1 38 53.23	2.0097	7 48 1.5	8.918
17	0 7 25.89	1.9007	0 31 13.0	9.442	17	1 40 53.92	2.0132	7 56 55.8	8.892
18	0 9 19.96	1.9018	0 40 39.6	9.444	18	1 42 54.81	2.0167	8 5 48.5	8.864
19	0 11 14.11	1.9031	0 50 6.3	9.446	19	1 44 55.92	2.0203	8 14 39.5	8.836
20	0 13 8.33	1.9043	0 59 33.1	9.447	20	1 46 57.25	2.0240	8 23 28.8	8.807
21	0 15 2.63	1.9057	1 9 0.0	9.448	21	1 48 58.80	2.0277	8 32 16.3	8.777
22	0 16 57.01	1.9071	1 18 26.9	9.448	22	1 51 0.57	2.0314	8 41 2.0	8.747
23	0 18 51.48	1.9085	1 27 53.8	9.448	23	1 53 2.57	2.0353	8 49 45.9	8.716
24	0 20 46.03	1.9099	N. 1 37 20.6	9.447	24	1 55 4.81	2.0392	N. 8 58 27.9	8.683

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 25.					WEDNESDAY 27.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
1	1 55 4.81	2.0392	N. 8 58 27.9	8.683	1	3 38 12.03	2.2703	N. 15 2 37.3	6.143
2	1 57 7.28	2.0431	9 7 7.9	8.651	2	3 40 28.42	2.2758	15 8 43.6	6.067
3	1 59 9.98	2.0470	9 15 46.0	8.618	3	3 42 45.13	2.2812	15 14 45.3	5.989
4	2 1 12.92	2.0510	9 24 22.0	8.583	4	3 45 2 17	2.2867	15 20 42.3	5.911
5	2 3 16.10	2.0551	9 32 56.0	8.548	5	3 47 19.53	2.2922	15 26 34.6	5.833
6	2 5 19.53	2.0592	9 41 27.8	8.512	6	3 49 37.23	2.2978	15 32 22.2	5.753
7	2 7 23.21	2.0633	9 49 57.4	8.475	7	3 51 55.26	2.3032	15 38 4.9	5.671
8	2 9 27.13	2.0675	9 58 24.8	8.438	8	3 54 13.61	2.3086	15 43 42.7	5.588
9	2 11 31.31	2.0718	10 6 50.0	8.400	9	3 56 32.29	2.3142	15 49 15.5	5.506
10	2 13 35.74	2.0760	10 15 12.8	8.361	10	3 58 51.31	2.3197	15 54 43.4	5.422
11	2 15 40.43	2.0803	10 23 33.3	8.321	11	4 1 10.65	2.3251	16 0 6.1	5.336
12	2 17 45.38	2.0847	10 31 51.3	8.280	12	4 3 30.32	2.3307	16 5 23.7	5.250
13	2 19 50.59	2.0891	10 40 6.9	8.238	13	4 5 50.33	2.3362	16 10 36.1	5.163
14	2 21 56.07	2.0935	10 48 19.9	8.196	14	4 8 10.66	2.3416	16 15 43.2	5.071
15	2 24 1.81	2.0980	10 56 30.4	8.153	15	4 10 31.32	2.3471	16 20 45.0	4.985
16	2 26 7.83	2.1026	11 4 38.3	8.109	16	4 12 52.31	2.3525	16 25 41.4	4.894
17	2 28 14.12	2.1072	11 12 43.5	8.064	17	4 15 13.62	2.3579	16 30 32.3	4.802
18	2 30 20.69	2.1118	11 20 46.0	8.018	18	4 17 35.26	2.3633	16 35 17.7	4.711
19	2 32 27.53	2.1164	11 28 45.7	7.971	19	4 19 57.22	2.3687	16 39 57.6	4.618
20	2 34 34.65	2.1211	11 36 42.5	7.923	20	4 22 19.50	2.3741	16 44 31.8	4.523
21	2 36 42.06	2.1258	11 44 36.5	7.876	21	4 24 42.11	2.3795	16 49 0.3	4.428
22	2 38 49.75	2.1305	11 52 27.6	7.827	22	4 27 5.04	2.3848	16 53 23.1	4.334
23	2 40 57.73	2.1353	12 0 15.7	7.776	23	4 29 28.29	2.3901	16 57 40.1	4.234
24	2 43 5.99	2.1402	N. 12 8 0.7	7.725	24	4 31 51.85	2.3953	N. 17 1 51.2	4.135
TUESDAY 26.					THURSDAY 28.				
0	2 45 14.55	2.1451	N. 12 15 42.7	7.673	0	4 34 15.73	2.4007	N. 17 5 56.3	4.036
1	2 47 23.40	2.1500	12 23 21.5	7.620	1	4 36 39.93	2.4059	17 9 55.5	3.936
2	2 49 32.55	2.1550	12 30 57.1	7.567	2	4 39 4.44	2.4112	17 13 48.6	3.834
3	2 51 42.00	2.1599	12 38 29.5	7.513	3	4 41 29.27	2.4163	17 17 35.6	3.732
4	2 53 51.74	2.1649	12 45 58.6	7.457	4	4 43 54.40	2.4214	17 21 16.4	3.638
5	2 56 1.79	2.1700	12 53 24.3	7.399	5	4 46 19.84	2.4266	17 24 51.0	3.525
6	2 58 12.14	2.1750	13 0 46.5	7.342	6	4 48 45.59	2.4317	17 28 19.4	3.420
7	3 0 22.79	2.1801	13 8 5.3	7.284	7	4 51 11.64	2.4367	17 31 41.4	3.313
8	3 2 33.75	2.1853	13 15 20.6	7.225	8	4 53 37.99	2.4417	17 34 57.0	3.206
9	3 4 45.02	2.1904	13 22 32.3	7.164	9	4 56 4.64	2.4467	17 38 6.1	3.097
10	3 6 56.60	2.1956	13 29 40.3	7.103	10	4 58 31.59	2.4516	17 41 8.7	2.989
11	3 9 8.49	2.2008	13 36 44.6	7.041	11	5 0 58.83	2.4563	17 44 4.8	2.880
12	3 11 20.69	2.2060	13 43 45.2	6.978	12	5 3 26.35	2.4612	17 46 54.3	2.769
13	3 13 33.21	2.2113	13 50 42.0	6.913	13	5 5 54.17	2.4660	17 49 37.1	2.657
14	3 15 46.04	2.2165	13 57 34.8	6.848	14	5 8 22.27	2.4707	17 52 13.2	2.545
15	3 17 59.19	2.2218	14 4 23.8	6.782	15	5 10 50.66	2.4754	17 54 42.5	2.432
16	3 20 12.66	2.2272	14 11 8.7	6.715	16	5 13 19.32	2.4800	17 57 5.0	2.318
17	3 22 26.46	2.2326	14 17 49.6	6.647	17	5 15 48.26	2.4846	17 59 20.6	2.203
18	3 24 40.57	2.2378	14 24 26.4	6.578	18	5 18 17.47	2.4891	18 1 29.3	2.087
19	3 26 55.00	2.2433	14 30 59.0	6.508	19	5 20 46.95	2.4935	18 3 31.0	1.970
20	3 29 9.76	2.2487	14 37 27.4	6.437	20	5 23 16.69	2.4979	18 5 25.7	1.853
21	3 31 24.84	2.2541	14 43 51.5	6.365	21	5 25 46.70	2.5023	18 7 13.4	1.736
22	3 33 40.25	2.2595	14 50 11.2	6.292	22	5 28 16.96	2.5065	18 8 54.0	1.617
23	3 35 55.98	2.2648	14 56 26.5	6.218	23	5 30 47.48	2.5107	18 10 27.4	1.497
24	3 38 12.03	2.2703	N. 15 2 37.3	6.143	24	5 33 18.24	2.5148	N. 18 11 53.6	1.377

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 29.					SUNDAY 31.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	5 33 18.24	2.5148	N.18 11 53.6	1.377	0	7 37 10.27	2.6103	N.16 50 47.4	4.808
1	5 35 49.25	2.5188	18 13 12.6	1.255	1	7 39 46.88	2.6099	16 45 55.1	4.935
2	5 38 20.50	2.5228	18 14 24.2	1.133	2	7 42 23.46	2.6094	16 40 55.2	5.062
3	5 40 51.99	2.5267	18 15 28.6	1.012	3	7 45 0.01	2.6089	16 35 47.7	5.187
4	5 43 23.71	2.5305	18 16 25.6	0.888	4	7 47 36.53	2.6083	16 30 32.8	5.311
5	5 45 55.65	2.5343	18 17 15.1	0.764	5	7 50 13.01	2.6076	16 25 10.4	5.436
6	5 48 27.82	2.5380	18 17 57.3	0.641	6	7 52 49.44	2.6068	16 19 40.5	5.559
7	5 51 0.21	2.5417	18 18 32.0	0.515	7	7 55 25.82	2.6058	16 14 3.3	5.682
8	5 53 32.82	2.5452	18 18 59.1	0.389	8	7 58 2.14	2.6048	16 8 18.7	5.804
9	5 56 5.63	2.5486	18 19 18.7	0.264	9	8 0 38.39	2.6037	16 2 26.8	5.925
10	5 58 38.65	2.5519	18 19 30.8	0.138	10	8 3 14.58	2.6026	15 56 27.7	6.045
11	6 1 11.86	2.5552	18 19 35.3	+0.011	11	8 5 50.70	2.6013	15 50 21.4	6.165
12	6 3 45.27	2.5584	18 19 32.1	-0.117	12	8 8 26.73	2.5998	15 44 7.9	6.283
13	6 6 18.87	2.5615	18 19 21.3	0.245	13	8 11 2.68	2.5985	15 37 47.4	6.401
14	6 8 52.65	2.5645	18 19 2.7	0.373	14	8 13 38.55	2.5970	15 31 19.8	6.518
15	6 11 26.61	2.5675	18 18 36.5	0.502	15	8 16 14.32	2.5953	15 24 45.2	6.634
16	6 14 0.75	2.5703	18 18 2.5	0.632	16	8 18 49.99	2.5937	15 18 3.7	6.748
17	6 16 35.05	2.5731	18 17 20.7	0.762	17	8 21 25.56	2.5919	15 11 15.4	6.862
18	6 19 9.52	2.5758	18 16 31.1	0.891	18	8 24 1.02	2.5901	15 4 20.2	6.976
19	6 21 44.14	2.5783	18 15 33.8	1.021	19	8 26 36.37	2.5882	14 57 18.3	7.087
20	6 24 18.91	2.5808	18 14 28.6	1.152	20	8 29 11.60	2.5862	14 50 9.8	7.198
21	6 26 53.83	2.5832	18 13 15.6	1.283	21	8 31 46.71	2.5842	14 42 54.6	7.308
22	6 29 28.89	2.5854	18 11 54.7	1.413	22	8 34 21.70	2.5821	14 35 32.8	7.417
23	6 32 4.08	2.5875	N.18 10 26.0	1.544	23	8 36 56.56	2.5798	N.14 28 4.5	7.525
SATURDAY 30.					MONDAY, FEBRUARY 1, 1904.				
0	6 34 39.39	2.5896	N.18 8 49.4	1.676	0	8 39 31.28	2.5776	N.14 20 29.8	7.631
1	6 37 14.83	2.5917	18 7 4.9	1.808	PHASES OF THE MOON.				
2	6 39 50.39	2.5936	18 5 12.5	1.939					
3	6 42 26.06	2.5954	18 3 12.2	2.071					
4	6 45 1.84	2.5971	18 1 4.0	2.203					
5	6 47 37.71	2.5987	17 58 47.9	2.334	<div> <div>d h m</div> <div>○ Full Moon . . . . Jan. 2 17 47.4</div> <div>☾ Last Quarter . . . . . 9 9 10.1</div> <div>● New Moon . . . . . 17 3 46.6</div> <div>☾ First Quarter . . . . . 25 8 41.0</div> </div>				
6	6 50 13.68	2.6003	17 56 23.9	2.466					
7	6 52 49.74	2.6017	17 53 52.0	2.598					
8	6 55 25.88	2.6029	17 51 12.2	2.730					
9	6 58 2.09	2.6041	17 48 24.4	2.862	<div> <div>d h</div> <div>☾ Perigee . . . . . Jan. 4 0.5</div> <div>☾ Apogee . . . . . 19 11.0</div> </div>				
10	7 0 38.37	2.6053	17 45 28.8	2.992					
11	7 3 14.72	2.6063	17 42 25.3	3.124					
12	7 5 51.12	2.6071	17 39 13.9	3.256					
13	7 8 27.57	2.6079	17 35 54.6	3.387					
14	7 11 4.07	2.6087	17 32 27.4	3.518					
15	7 13 40.61	2.6093	17 28 52.4	3.648					
16	7 16 17.19	2.6098	17 25 9.6	3.779					
17	7 18 53.79	2.6102	17 21 18.9	3.909					
18	7 21 30.41	2.6105	17 17 20.5	4.038					
19	7 24 7.05	2.6107	17 13 14.3	4.168					
20	7 26 43.70	2.6108	17 9 0.3	4.297					
21	7 29 20.35	2.6108	17 4 38.6	4.426					
22	7 31 57.00	2.6108	17 0 9.2	4.554					
23	7 34 33.64	2.6106	16 55 32.1	4.682					
24	7 37 10.27	2.6103	N.16 50 47.4	4.808					

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III <sup>h</sup>	P. L. of Diff.	VI <sup>h</sup>	P. L. of Diff.	IX <sup>h</sup>	P. L. of Diff.
1	JUPITER	W.	87 45 19	2251	89 32 31	2235	91 20 6	2221	93 8 2	2208
	$\alpha$ Pegasi	W.	85 32 25	2432	87 15 14	2417	88 58 25	2402	90 41 57	2389
	$\alpha$ Arietis	W.	41 54 32	2444	43 37 4	2414	45 20 19	2386	47 4 14	2360
	Pollux	E.	37 55 47	2446	36 13 17	2453	34 30 57	2465	32 48 54	2482
	Regulus	E.	72 54 55	2207	71 6 38	2192	69 17 59	2179	67 29 0	2165
2	JUPITER	W.	102 12 34	2147	104 2 21	2137	105 52 24	2128	107 42 41	2118
	$\alpha$ Pegasi	W.	99 23 58	2337	101 9 4	2329	102 54 21	2324	104 39 46	2319
	$\alpha$ Arietis	W.	55 52 23	2256	57 39 28	2239	59 26 58	2223	61 14 51	2210
	Aldebaran	W.	21 49 24	2100	23 40 23	2090	25 31 38	2079	27 23 9	2070
	Regulus	E.	58 19 11	2106	56 28 21	2097	54 37 17	2087	52 45 58	2079
	Spica	E.	111 50 26	2109	109 59 40	2098	108 8 37	2088	106 17 19	2079
3	$\alpha$ Arietis	W.	70 18 53	2157	72 8 25	2150	73 58 8	2143	75 48 1	2139
	Aldebaran	W.	36 43 53	2035	38 36 32	2031	40 29 18	2026	42 22 11	2024
	Regulus	E.	43 26 35	2049	41 34 17	2045	39 41 53	2043	37 49 25	2041
	Spica	E.	96 57 43	2044	95 5 18	2039	93 12 45	2035	91 20 6	2032
4	$\alpha$ Arietis	W.	84 58 49	2128	86 49 6	2129	88 39 21	2130	90 29 34	2134
	Aldebaran	W.	51 47 28	2018	53 40 34	2019	55 33 39	2021	57 26 40	2024
	Regulus	E.	28 26 56	2048	26 34 37	2053	24 42 26	2061	22 50 27	2070
	Spica	E.	81 56 1	2028	80 3 10	2028	78 10 20	2031	76 17 34	2034
5	Aldebaran	W.	66 50 26	2046	68 42 48	2053	70 35 0	2060	72 27 1	2068
	Pollux	W.	25 42 7	2516	27 22 58	2467	29 4 58	2428	30 47 53	2398
	Spica	E.	66 55 11	2058	65 3 7	2065	63 11 14	2073	61 19 33	2081
	VENUS	E.	105 0 58	2400	103 17 23	2408	101 33 59	2415	99 50 45	2424
6	Aldebaran	W.	81 43 50	2114	83 34 28	2124	85 24 50	2136	87 14 54	2147
	Pollux	W.	39 30 35	2325	41 15 58	2320	43 1 28	2319	44 47 0	2319
	Spica	E.	52 4 32	2130	50 14 19	2142	48 24 24	2154	46 34 47	2167
	VENUS	E.	91 17 55	2475	89 36 6	2486	87 54 33	2499	86 13 18	2511
	Antares	E.	97 47 49	2171	95 58 38	2181	94 9 42	2192	92 21 3	2204
	SUN	E.	134 19 22	2456	132 37 7	2466	130 55 6	2477	129 13 20	2488
7	Aldebaran	W.	96 20 42	2211	98 8 54	2224	99 56 46	2237	101 44 18	2252
	Pollux	W.	53 33 52	2342	55 18 51	2350	57 3 38	2358	58 48 13	2368
	Regulus	W.	16 33 38	2284	18 20 1	2285	20 6 23	2279	21 52 39	2295
	Spica	E.	37 31 49	2239	35 44 19	2255	33 57 13	2272	32 10 32	2289
	VENUS	E.	77 51 37	2580	76 12 15	2595	74 33 13	2610	72 54 32	2626
	Antares	E.	83 22 17	2268	81 35 30	2282	79 49 4	2296	78 2 58	2311
	SUN	E.	120 48 38	2551	119 8 35	2564	117 28 51	2579	115 49 27	2593
8	Pollux	W.	67 27 27	2423	69 10 29	2436	70 53 13	2448	72 35 39	2461
	Regulus	W.	30 40 54	2346	32 25 46	2359	34 10 19	2372	35 54 34	2385
	VENUS	E.	64 46 24	2705	63 9 51	2721	61 33 39	2738	59 57 49	2754
	Antares	E.	69 18 1	2388	67 34 9	2405	65 50 41	2422	64 7 37	2438
	SUN	E.	107 37 24	2668	106 0 1	2684	104 22 59	2699	102 46 18	2715
9	Pollux	W.	81 3 12	2529	82 43 45	2543	84 23 59	2556	86 3 54	2570
	Regulus	W.	44 31 0	2453	46 13 19	2467	47 55 18	2481	49 36 58	2495
	VENUS	E.	52 4 3	2836	50 30 22	2852	48 57 2	2869	47 24 3	2885
	Antares	E.	55 38 20	2526	53 57 43	2544	52 17 31	2563	50 37 45	2583
	SUN	E.	94 48 4	2794	93 13 28	2809	91 39 12	2825	90 5 16	2840



## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
1	JUPITER	W.	94 56 18	2194	96 44 54	2182	98 33 49	2169	100 23 3	2158
	α Pegasi	W.	92 25 48	2376	94 9 57	2364	95 54 23	2354	97 39 4	2345
	α Arietis	W.	48 48 46	2335	50 33 54	2313	52 19 34	2293	54 5 44	2273
	Pollux	E.	31 7 15	2504	29 26 7	2535	27 45 43	2575	26 6 14	2628
	Regulus	E.	65 39 40	2152	63 50 0	2140	62 0 1	2128	60 9 44	2117
2	JUPITER	W.	109 33 12	2111	111 23 55	2103	113 14 49	2096	115 5 54	2090
	α Pegasi	W.	106 25 18	2315	108 10 55	2314	109 56 34	2313	111 42 14	2314
	α Arietis	W.	63 3 4	2196	64 51 37	2185	66 40 27	2175	68 29 33	2165
	Aldebaran	W.	29 14 54	2062	31 6 52	2055	32 59 1	2047	34 51 22	2041
	Regulus	E.	50 54 27	2072	49 2 44	2064	47 10 50	2059	45 18 47	2053
	Spica	E.	104 25 48	2070	102 34 3	2063	100 42 7	2056	98 50 0	2050
3	α Arietis	W.	77 38 1	2134	79 28 8	2132	81 18 19	2130	83 8 33	2128
	Aldebaran	W.	44 15 8	2021	46 8 10	2019	48 1 15	2018	49 54 21	2018
	Regulus	E.	35 56 54	2040	34 4 22	2040	32 11 50	2042	30 19 21	2041
	Spica	E.	89 27 22	2030	87 34 35	2023	85 41 45	2027	83 48 53	2027
4	α Arietis	W.	92 19 42	2137	94 9 45	2141	95 59 42	2117	97 49 30	2153
	Aldebaran	W.	59 19 37	2026	61 12 30	2031	63 5 16	2035	64 57 55	2041
	Regulus	E.	20 58 42	2083	19 7 16	2098	17 16 14	2120	15 25 45	2147
	Spica	E.	74 24 53	2037	72 32 17	2011	70 39 47	2016	68 47 25	2052
5	Aldebaran	W.	74 18 50	2076	76 10 26	2085	78 1 49	2094	79 52 57	2104
	Pollux	W.	32 31 31	2373	34 15 44	2355	36 0 23	2342	37 45 21	2331
	Spica	E.	59 28 4	2089	57 36 48	2099	55 45 47	2109	53 55 1	2120
	VENUS	E.	98 7 44	2432	96 24 55	2442	94 42 20	2453	93 0 0	2463
6	Aldebaran	W.	89 4 41	2160	90 54 9	2171	92 43 20	2184	94 32 11	2198
	Pollux	W.	46 32 32	2321	48 18 1	2324	50 3 25	2328	51 48 43	2335
	Spica	E.	44 45 30	2181	42 56 33	2194	41 7 57	2208	39 19 42	2223
	VENUS	E.	84 32 20	2525	82 51 41	2538	81 11 20	2551	79 31 18	2566
	Antares	E.	90 32 41	2216	88 44 37	2228	86 56 51	2241	85 9 24	2254
	SUN	E.	127 31 50	2500	125 50 36	2512	124 9 39	2524	122 28 59	2538
7	Aldebaran	W.	103 31 29	2266	105 18 19	2279	107 4 49	2294	108 50 57	2309
	Pollux	W.	60 32 34	2378	62 16 41	2389	64 0 32	2399	65 44 8	2411
	Regulus	W.	23 38 46	2304	25 24 40	2313	27 10 21	2324	28 55 46	2335
	Spica	E.	30 24 17	2307	28 38 28	2327	26 53 8	2348	25 8 18	2361
	VENUS	E.	71 16 12	2641	69 38 13	2657	68 0 35	2673	66 23 19	2689
	Antares	E.	76 17 14	2326	74 31 52	2341	72 46 52	2357	71 2 15	2373
	SUN	E.	114 10 22	2607	112 31 37	2622	110 53 12	2638	109 15 8	2652
8	Pollux	W.	74 17 47	2474	75 59 37	2487	77 41 8	2502	79 22 19	2515
	Regulus	W.	37 38 30	2398	39 22 7	2412	41 5 24	2426	42 48 22	2440
	VENUS	E.	58 22 21	2770	56 47 14	2787	55 12 29	2803	53 38 5	2820
	Antares	E.	62 24 57	2455	60 42 41	2472	59 0 49	2490	57 19 22	2504
	SUN	E.	101 9 58	2730	99 33 58	2746	97 58 19	2762	96 23 1	2778
9	Pollux	W.	87 43 30	2585	89 22 46	2599	91 1 42	2613	92 40 20	2627
	Regulus	W.	51 18 18	2509	52 59 19	2522	54 40 1	2536	56 20 24	2550
	VENUS	E.	45 51 25	2902	44 19 8	2917	42 47 11	2933	41 15 34	2950
	Antares	E.	48 58 26	2702	47 19 33	2622	45 41 8	2642	44 3 10	2663
	SUN	E.	88 31 40	2855	86 58 24	2871	85 25 28	2886	83 52 51	2901

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
10	Pollux W.	94 18 38	2641	95 56 37	2655	97 34 17	2669	99 11 38	2684
	Regulus W.	58 0 28	2563	59 40 14	2576	61 19 42	2590	62 58 51	2602
	VENUS E.	39 44 18	2965	38 13 21	2981	36 42 44	2997	35 12 27	3012
	Antares E.	42 25 40	2685	40 48 40	2708	39 12 10	2732	37 36 12	2756
	SUN E.	82 20 33	2916	80 48 35	2931	79 16 56	2946	77 45 35	2960
11	Regulus W.	71 10 17	2665	72 47 44	2677	74 24 55	2688	76 1 51	2700
	Spica W.	17 56 29	2759	19 31 51	2757	21 7 16	2757	22 42 41	2758
	VENUS E.	27 45 48	3089	26 17 25	3105	24 49 21	3120	23 21 36	3136
	Antares E.	29 45 16	2910	28 13 10	2950	26 41 55	2996	25 11 37	3048
	SUN E.	70 13 17	3030	68 43 41	3043	67 14 22	3056	65 45 18	3069
12	Regulus W.	84 2 42	2755	85 38 9	2765	87 13 23	2776	88 48 23	2785
	Spica W.	30 38 31	2786	32 13 17	2793	33 47 54	2801	35 22 21	2808
	SUN E.	58 23 57	3131	56 56 25	3143	55 29 8	3155	54 2 5	3167
13	Spica W.	43 12 7	2847	44 45 34	2854	46 18 52	2862	47 52 0	2870
	SUN E.	46 50 13	3222	45 24 30	3233	43 59 0	3243	42 33 42	3254
14	Spica W.	55 35 19	2905	57 7 32	2912	58 39 36	2918	60 11 32	2925
	SUN E.	35 30 22	3308	34 6 20	3319	32 42 30	3330	31 18 53	3342
19	SUN W.	20 18 18	3572	21 37 23	3562	22 56 39	3553	24 16 5	3546
	α Arietis E.	77 53 1	3191	76 26 41	3194	75 0 25	3198	73 34 13	3200
	Aldebaran E.	110 36 42	3074	109 8 0	3074	107 39 19	3075	106 10 39	3077
20	SUN W.	30 54 56	3520	32 14 58	3516	33 35 5	3512	34 55 16	3509
	α Arietis E.	66 24 3	3215	64 58 12	3218	63 32 24	3221	62 6 40	3225
	Aldebaran E.	98 47 37	3078	97 19 1	3078	95 50 25	3078	94 21 48	3077
21	SUN W.	41 37 13	3489	42 57 50	3484	44 18 32	3480	45 39 19	3475
	α Arietis E.	54 58 58	3242	53 33 39	3246	52 8 24	3251	50 43 15	3256
	Aldebaran E.	86 58 20	3069	85 29 32	3065	84 0 40	3063	82 31 45	3060
22	SUN W.	52 24 41	3446	53 46 6	3439	55 7 38	3432	56 29 18	3425
	MARS W.	21 17 28	3387	22 39 59	3376	24 2 43	3365	25 25 40	3354
	α Arietis E.	43 39 9	3289	42 14 45	3300	40 50 33	3310	39 26 33	3323
	Aldebaran E.	75 5 59	3038	73 36 33	3033	72 7 1	3026	70 37 21	3021
23	SUN W.	63 19 51	3383	64 42 27	3372	66 5 15	3363	67 28 14	3352
	Fomalhaut W.	38 7 8	4098	39 17 12	4020	40 28 32	3947	41 41 4	3881
	MARS W.	32 23 30	3301	33 47 41	3290	35 12 4	3278	36 36 41	3266
	α Pegasi W.	23 50 46	5018	24 47 27	4782	25 47 18	4581	26 49 59	4409
	α Arietis E.	32 31 2	3243	31 9 11	3455	29 47 56	3492	28 27 23	3537
	Aldebaran E.	63 6 59	2984	61 36 26	2976	60 5 43	2967	58 34 49	2958
24	SUN W.	74 26 21	3294	75 50 40	3281	77 15 14	3267	78 40 4	3253
	Fomalhaut W.	47 59 11	3614	49 17 30	3570	50 36 37	3529	51 56 29	3489
	MARS W.	43 43 14	3205	45 9 17	3192	46 35 36	3178	48 2 11	3164
	α Pegasi W.	32 37 0	3817	33 51 45	3734	35 7 56	3660	36 25 26	3592
	JUPITER W.	25 34 43	2936	27 5 13	2974	28 35 59	2960	30 7 2	2946
	Aldebaran E.	50 57 12	2905	49 25 0	2895	47 52 32	2882	46 19 50	2869
	Pollux E.	94 31 40	2992	93 1 17	2979	91 30 38	2967	89 59 44	2955

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
10	Pollux W.	100 48 40	2697	102 25 24	2711	104 1 49	2726	105 37 55	2739
	Regulus W.	64 37 43	2615	66 16 17	2628	67 54 34	2641	69 32 34	2653
	VENUS E.	33 42 29	3027	32 12 50	3043	30 43 31	3058	29 14 30	3074
	Antares E.	36 0 47	2782	34 25 56	2811	32 51 42	2842	31 18 8	2874
	SUN E.	76 14 32	2974	74 43 47	2988	73 13 19	3002	71 43 9	3017
11	Regulus W.	77 38 31	2712	79 14 55	2723	80 51 5	2734	82 27 0	2744
	Spica W.	24 18 4	2762	25 53 22	2767	27 28 33	2773	29 3 36	2779
	VENUS E.	21 54 10	3153	20 27 4	3170	19 0 19	3188	17 33 55	3207
	Antares E.	23 42 23	3108	22 14 23	3178	20 47 48	3261	19 22 51	3366
	SUN E.	64 16 31	3083	62 48 0	3095	61 19 44	3107	59 51 43	3119
12	Regulus W.	90 23 10	2795	91 57 45	2805	93 32 7	2814	95 6 17	2823
	Spica W.	36 56 38	2816	38 30 45	2823	40 4 43	2832	41 38 30	2839
	SUN E.	52 35 16	3178	51 8 40	3189	49 42 18	3200	48 16 9	3211
13	Spica W.	49 24 58	2877	50 57 47	2884	52 30 27	2891	54 2 58	2898
	SUN E.	41 8 37	3265	39 43 45	3276	38 19 5	3286	36 54 37	3297
14	Spica W.	61 43 19	2931	63 14 58	2938	64 46 29	2944	66 17 52	2950
	SUN E.	29 55 30	3354	28 32 21	3367	27 9 27	3379	25 46 47	3394
19	SUN W.	25 35 38	3539	26 55 19	3534	28 15 6	3528	29 34 59	3524
	α Arietis E.	72 8 4	3203	70 41 58	3206	69 15 56	3209	67 49 58	3212
	Aldebaran E.	104 42 1	3078	103 13 24	3078	101 44 48	3078	100 16 12	3079
20	SUN W.	36 15 30	3505	37 35 49	3500	38 56 13	3497	40 16 41	3493
	α Arietis E.	60 41 0	3227	59 15 23	3231	57 49 51	3234	56 24 22	3238
	Aldebaran E.	92 53 10	3076	91 24 31	3074	89 55 50	3072	88 27 6	3070
21	SUN W.	47 0 11	3470	48 21 9	3464	49 42 13	3458	51 3 24	3453
	α Arietis E.	49 18 12	3261	47 53 15	3267	46 28 25	3274	45 3 43	3281
	Aldebaran E.	81 2 46	3056	79 33 42	3052	78 4 33	3048	76 35 19	3043
22	SUN W.	57 51 6	3417	59 13 3	3409	60 35 9	3401	61 57 25	3392
	MARS W.	26 48 49	3343	28 12 11	3332	29 35 45	3322	30 59 31	3311
	α Arietis E.	38 2 48	3337	36 39 19	3354	35 16 10	3373	33 53 23	3396
	Aldebaran E.	69 7 34	3014	67 37 39	3007	66 7 35	3000	64 37 22	2992
23	SUN W.	68 51 25	3341	70 14 49	3331	71 38 25	3318	73 2 16	3306
	Fomalhaut W.	42 54 43	3221	44 9 24	3763	45 25 5	3710	46 41 42	3661
	MARS W.	38 1 32	3255	39 26 36	3243	40 51 54	3231	42 17 26	3218
	α Pegasi W.	27 55 12	4258	29 2 44	4127	30 12 20	4011	31 23 49	3909
	α Arietis E.	27 7 40	3591	25 48 56	3656	24 31 22	3736	23 15 13	3833
	Aldebaran E.	57 3 43	2948	55 32 25	2938	54 0 54	2928	52 29 10	2916
24	SUN W.	80 5 11	3239	81 30 34	3224	82 56 15	3209	84 22 13	3104
	Fomalhaut W.	53 17 5	3451	54 38 24	3416	56 0 23	3382	57 23 0	3348
	MARS W.	49 29 3	3149	50 56 13	3135	52 23 40	3120	53 51 25	3105
	α Pegasi W.	37 44 9	3530	39 4 0	3472	40 24 55	3420	41 46 49	3371
	JUPITER W.	31 38 22	2933	33 9 59	2919	34 41 54	2905	36 14 7	2890
	Aldebaran E.	44 46 51	2856	43 13 36	2842	41 40 3	2829	40 6 13	2815
	Pollux E.	88 28 35	2943	86 57 10	2929	85 25 28	2916	83 53 29	2902

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
25	SUN W.	85 48 30	3178	87 15 6	3162	88 42 1	3145	90 9 16	3128
	Fomalhaut W.	58 46 16	3316	60 10 9	3285	61 34 38	3256	62 59 41	3226
	MARS W.	55 19 29	3088	56 47 53	3072	58 16 37	3056	59 45 41	3039
	$\alpha$ Pegasi W.	43 9 39	3324	44 33 23	3281	45 57 57	3240	47 23 19	3201
	JUPITER W.	37 46 39	2875	39 19 30	2859	40 52 41	2844	42 26 12	2828
	Aldebaran E.	38 32 5	2801	36 57 38	2786	35 22 52	2771	33 47 46	2755
	Pollux E.	82 21 13	2888	80 48 39	2875	79 15 48	2860	77 42 38	2846
26	SUN W.	97 30 48	3039	99 0 13	3019	100 30 2	3001	102 0 14	2981
	Fomalhaut W.	70 13 20	3092	71 41 40	3067	73 10 30	3042	74 39 51	3018
	MARS W.	67 16 22	2950	68 47 38	2931	70 19 17	2912	71 51 21	2893
	$\alpha$ Pegasi W.	54 41 7	3030	56 10 43	2999	57 40 57	2970	59 11 48	2941
	JUPITER W.	50 19 7	2744	51 54 49	2726	53 30 55	2708	55 7 25	2690
	Aldebaran E.	25 47 1	2674	24 9 46	2657	22 32 8	2640	20 54 7	2622
	Pollux E.	69 52 5	2772	68 17 0	2756	66 41 35	2741	65 5 50	2727
	Regulus E.	105 50 30	2679	104 13 22	2661	102 35 50	2643	100 57 54	2626
27	SUN W.	109 37 24	2882	111 10 6	2862	112 43 14	2842	114 16 48	2821
	Fomalhaut W.	82 13 55	2904	83 46 9	2883	85 18 50	2862	86 51 58	2842
	MARS W.	79 37 53	2794	81 12 29	2774	82 47 31	2753	84 23 0	2733
	$\alpha$ Pegasi W.	66 54 57	2805	68 29 18	2781	70 4 11	2756	71 39 37	2732
	JUPITER W.	63 16 5	2596	64 55 6	2577	66 34 33	2557	68 14 27	2538
	$\alpha$ Arietis W.	24 6 8	2370	25 30 55	2365	26 57 46	2374	28 26 27	2394
	Pollux E.	57 2 10	2654	55 24 28	2640	53 46 27	2627	52 8 8	2614
	Regulus E.	92 42 5	2533	91 1 38	2515	89 20 45	2496	87 39 26	2476
28	SUN W.	122 11 21	2720	123 47 35	2699	125 24 17	2679	127 1 25	2659
	Fomalhaut W.	94 43 58	2749	96 19 33	2732	97 55 31	2717	99 31 49	2702
	MARS W.	92 27 12	2631	94 5 25	2610	95 44 6	2591	97 23 14	2571
	$\alpha$ Pegasi W.	79 44 39	2618	81 23 10	2596	83 2 10	2575	84 41 39	2556
	JUPITER W.	76 40 42	2441	78 23 19	2421	80 6 24	2402	81 49 56	2383
	$\alpha$ Arietis W.	36 11 41	2704	37 48 16	2661	39 25 49	2619	41 4 18	2581
	Pollux E.	43 52 37	2564	42 12 53	2559	40 33 1	2555	38 53 4	2553
	Regulus E.	79 6 3	2381	77 22 1	2362	75 37 31	2343	73 52 34	2325
29	$\alpha$ Pegasi W.	93 5 43	2464	94 47 47	2448	96 30 14	2433	98 13 2	2418
	JUPITER W.	90 34 23	2291	92 20 36	2273	94 7 15	2256	95 54 20	2239
	$\alpha$ Arietis W.	49 28 49	2422	51 11 52	2395	52 55 34	2369	54 39 53	2344
	Aldebaran W.	15 7 25	2230	16 55 8	2213	18 43 17	2194	20 31 53	2177
	Pollux E.	30 34 13	2602	28 55 20	2629	27 17 4	2666	25 39 39	2717
	Regulus E.	65 1 6	2234	63 13 29	2217	61 25 27	2200	59 36 59	2184
30	JUPITER W.	104 55 50	2161	106 45 17	2147	108 35 4	2133	110 25 13	2120
	$\alpha$ Arietis W.	63 29 50	2239	65 17 20	2221	67 5 16	2204	68 53 38	2188
	Aldebaran W.	29 41 6	2099	31 32 7	2085	33 23 29	2072	35 15 12	2059
	Regulus E.	50 28 43	2109	48 37 57	2095	46 46 50	2083	44 55 24	2071
	Spica E.	103 59 27	2110	102 8 43	2096	100 17 37	2083	98 26 11	2070
31	$\alpha$ Arietis W.	78 0 58	2122	79 51 23	2113	81 42 3	2103	83 32 57	2096
	Aldebaran W.	44 38 24	2005	46 31 51	1996	48 25 32	1988	50 19 25	1981
	Regulus E.	35 34 2	2023	33 41 3	2016	31 47 54	2010	29 54 36	2007
	Spica E.	89 4 21	2016	87 11 11	2007	85 17 47	1999	83 24 11	1992

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
25	SUN W.	91 36 51	3110	93 4 48	3093	94 33 6	3075	96 1 46	3057
	Fomalhaut W.	64 25 19	3198	65 51 31	3171	67 18 15	3143	68 45 32	3118
	MARS W.	61 15 5	3022	62 44 51	3004	64 14 59	2986	65 45 29	2968
	α Pegasi W.	48 49 27	3164	50 16 19	3129	51 43 54	3095	53 12 10	3061
	JUPITER W.	44 0 3	2811	45 34 16	2795	47 8 51	2778	48 43 48	2761
	Aldebaran E.	32 12 19	2740	30 36 32	2724	29 0 24	2708	27 23 54	2690
	Pollux E.	76 9 10	2831	74 35 22	2817	73 1 16	2802	71 26 50	2787
26	SUN W.	103 30 50	2962	105 1 51	2943	106 33 16	2922	108 5 7	2902
	Fomalhaut W.	76 9 42	2994	77 40 2	2971	79 10 51	2948	80 42 9	2926
	MARS W.	73 23 49	2873	74 56 42	2854	76 30 0	2834	78 3 44	2815
	α Pegasi W.	60 43 15	2913	62 15 18	2884	63 47 57	2858	65 21 10	2832
	JUPITER W.	56 44 19	2672	58 21 37	2652	59 59 21	2634	61 37 30	2615
	Aldebaran E.	19 15 42	2604	17 36 52	2587	15 57 39	2569	14 18 2	2551
	Pollux E.	63 29 46	2711	61 53 21	2697	60 16 37	2682	58 39 33	2668
	Regulus E.	99 19 34	2608	97 40 50	2589	96 1 40	2571	94 22 5	2553
27	SUN W.	115 50 49	2800	117 25 17	2780	119 0 11	2755	120 35 33	2739
	Fomalhaut W.	88 25 32	2821	89 59 32	2802	91 33 57	2784	93 8 46	2766
	MARS W.	85 58 56	2713	87 35 19	2693	89 12 9	2672	90 49 27	2652
	α Pegasi W.	73 15 35	2708	74 52 5	2684	76 29 6	2661	78 6 38	2640
	JUPITER W.	69 54 48	2518	71 35 36	2499	73 16 51	2480	74 58 33	2460
	α Arietis W.	29 56 47	2924	31 28 36	2860	33 1 46	2803	34 36 10	2752
	Pollux E.	50 29 32	2602	48 50 40	2591	47 11 32	2581	45 32 11	2572
	Regulus E.	85 57 39	2458	84 15 26	2438	82 32 46	2419	80 49 38	2400
28	SUN W.	128 39 0	2640	130 17 1	2620	131 55 29	2602	133 34 22	2583
	Fomalhaut W.	101 8 27	2687	102 45 24	2675	104 22 38	2662	106 0 9	2652
	MARS W.	99 2 49	2551	100 42 51	2531	102 23 21	2512	104 4 18	2493
	α Pegasi W.	86 21 35	2536	88 1 58	2517	89 42 48	2499	91 24 3	2481
	JUPITER W.	83 33 55	2364	85 18 22	2346	87 3 15	2326	88 48 36	2309
	α Arietis W.	42 43 39	2546	44 23 49	2512	46 4 45	2480	47 46 26	2450
	Pollux E.	37 13 4	2554	35 33 6	2559	33 53 14	2567	32 13 34	2581
	Regulus E.	72 7 11	2305	70 21 19	2288	68 35 2	2269	66 48 17	2252
29	α Pegasi W.	99 56 11	2405	101 39 39	2392	103 23 25	2380	105 7 28	2370
	JUPITER W.	97 41 50	2222	99 29 45	2206	101 18 3	2190	103 6 45	2175
	α Arietis W.	56 24 48	2322	58 10 16	2299	59 56 17	2278	61 42 49	2258
	Aldebaran W.	22 20 55	2161	24 10 22	2145	26 0 13	2129	27 50 28	2114
	Pollux E.	24 3 21	2784	22 28 32	2873	20 55 38	2991	19 25 14	3151
	Regulus E.	57 48 7	2167	55 58 50	2152	54 9 10	2137	52 19 7	2123
30	JUPITER W.	112 15 41	2109	114 6 27	2097	115 57 31	2086	117 48 52	2075
	α Arietis W.	70 42 23	2173	72 31 31	2159	74 21 1	2146	76 10 50	2134
	Aldebaran W.	37 7 14	2046	38 59 36	2035	40 52 15	2024	42 45 12	2014
	Regulus E.	43 3 40	2059	41 11 38	2050	39 19 21	2039	37 26 48	2031
	Spica E.	96 34 25	2057	94 42 20	2046	92 49 57	2035	90 57 17	2025
31	α Arietis W.	85 24 3	2088	87 15 20	2083	89 6 46	2078	90 58 19	2074
	Aldebaran W.	52 13 30	1974	54 7 45	1969	56 2 9	1964	57 56 40	1960
	Regulus E.	28 1 12	2003	26 7 43	2002	24 14 11	2003	22 20 41	2005
	Spica E.	81 30 24	1986	79 36 27	1980	77 42 21	1975	75 48 8	1972

## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian	Equation of Time, to be Added to Apparent Time.	Diff for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ' "	"	' "	s	m s	s
Mon.	1	20 54 45.92	10.224	S. 17 24 48.7	+ 41.84	16 15.78	68.36	13 37.16	0.366
Tues.	2	20 58 50.88	10.189	17 7 55.4	42.60	16 15.63	68.24	13 45.55	0.332
Wed.	3	21 2 55.02	10.156	16 50 44.0	43.34	16 15.48	68.13	13 53.12	0.298
Thur.	4	21 6 58.35	10.122	16 33 15.0	+ 44.07	16 15.32	68.02	13 59.87	0.264
Frid.	5	21 11 0.88	10.088	16 15 28.6	44.78	16 15.16	67.91	14 5.81	0.231
Sat.	6	21 15 2.60	10.055	15 57 25.4	45.48	16 15.00	67.80	14 10.97	0.198
SUN.	7	21 19 3.53	10.022	15 39 5.6	+ 46.16	16 14.83	67.69	14 15.34	0.166
Mon.	8	21 23 3.68	9.990	15 20 29.8	46.82	16 14.65	67.57	14 18.93	0.133
Tues.	9	21 27 3.04	9.957	15 1 38.2	47.46	16 14.47	67.46	14 21.72	0.100
Wed.	10	21 31 1.62	9.924	14 42 31.5	+ 48.09	16 14.29	67.34	14 23.75	0.068
Thur.	11	21 34 59.42	9.892	14 23 10.0	48.70	16 14.10	67.23	14 24.99	0.036
Frid.	12	21 38 56.46	9.861	14 3 34.0	49.29	16 13.91	67.12	14 25.48	0.005
Sat.	13	21 42 52.74	9.829	13 43 44.1	+ 49.86	16 13.72	67.01	14 25.21	0.027
SUN.	14	21 46 48.27	9.798	13 23 40.6	50.42	16 13.53	66.90	14 24.19	0.058
Mon.	15	21 50 43.05	9.767	13 3 24.1	50.95	16 13.33	66.79	14 22.42	0.089
Tues.	16	21 54 37.10	9.737	12 42 54.8	+ 51.47	16 13.13	66.69	14 19.91	0.120
Wed.	17	21 58 30.41	9.706	12 22 13.4	51.97	16 12.93	66.58	14 16.68	0.150
Thur.	18	22 2 23.00	9.677	12 1 20.0	52.46	16 12.73	66.48	14 12.74	0.180
Frid.	19	22 6 14.89	9.647	11 40 15.3	+ 52.92	16 12.52	66.38	14 8.08	0.209
Sat.	20	22 10 6.07	9.618	11 18 59.6	53.37	16 12.31	66.28	14 2.72	0.238
SUN.	21	22 13 56.56	9.590	10 57 33.3	53.80	16 12.10	66.18	13 56.67	0.266
Mon.	22	22 17 46.37	9.562	10 35 57.0	+ 54.22	16 11.88	66.09	13 49.95	0.294
Tues.	23	22 21 35.52	9.534	10 14 10.8	54.62	16 11.67	66.00	13 42.57	0.321
Wed.	24	22 25 24.02	9.507	9 52 15.4	54.99	16 11.45	65.91	13 34.53	0.348
Thur.	25	22 29 11.88	9.481	9 30 11.2	+ 55.35	16 11.23	65.82	13 25.87	0.374
Frid.	26	22 32 59.12	9.456	9 7 58.4	55.70	16 11.01	65.74	13 16.58	0.399
Sat.	27	22 36 45.76	9.431	8 45 37.6	56.03	16 10.78	65.65	13 6.70	0.424
SUN.	28	22 40 31.82	9.408	8 23 9.0	56.34	16 10.54	65.57	12 56.23	0.448
Mon.	29	22 44 17.32	9.385	8 0 33.2	56.64	16 10.31	65.49	12 45.21	0.471
Tues.	30	22 48 2.28	9.363	S. 7 37 50.4	+ 56.92	16 10.07	65.42	12 33.65	0.492

NOTE.—The mean time of semidiameter passing the meridian may be found by subtracting 0° 19 from the sidereal time.  
The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

## AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination	Diff. for 1 Hour.			
		h m s	s	° "	"	m s	s	h m s
Mon.	1	20 54 43.60	10.223	S. 17 24 58.2	+ 41.83	13 37.08	0.367	20 41 6.52
Tues.	2	20 58 48.55	10.189	17 8 5.2	42.59	13 45.47	0.333	20 45 3.07
Wed.	3	21 2 52.67	10.155	16 50 54.1	43.33	13 53.05	0.299	20 48 59.63
Thur.	4	21 6 55.99	10.122	16 33 25.3	+ 44.06	13 59.81	0.265	20 52 56.18
Frid.	5	21 10 58.51	10.088	16 15 39.2	44.78	14 5.76	0.231	20 56 52.74
Sat.	6	21 15 0.22	10.055	15 57 36.1	45.47	14 10.92	0.198	21 0 49.29
SUN.	7	21 19 1.15	10.022	15 39 16.6	+ 46.15	14 15.30	0.166	21 4 45.85
Mon.	8	21 23 1.29	9.990	15 20 40.9	46.82	14 18.89	0.133	21 8 42.40
Tues.	9	21 27 0.65	9.957	15 1 49.6	47.46	14 21.70	0.101	21 12 38.95
Wed.	10	21 30 59.23	9.925	14 42 43.1	+ 48.08	14 23.73	0.068	21 16 35.51
Thur.	11	21 34 57.04	9.893	14 23 21.7	48.70	14 24.98	0.036	21 20 32.06
Frid.	12	21 38 54.09	9.861	14 3 45.9	49.28	14 25.48	0.005	21 24 28.62
Sat.	13	21 42 50.38	9.830	13 43 56.1	+ 49.86	14 25.22	0.027	21 28 25.17
SUN.	14	21 46 45.92	9.799	13 23 52.7	50.42	14 24.20	0.058	21 32 21.72
Mon.	15	21 50 40.71	9.768	13 3 36.3	50.95	14 22.44	0.089	21 36 18.28
Tues.	16	21 54 34.77	9.737	12 43 7.1	+ 51.47	14 19.94	0.119	21 40 14.83
Wed.	17	21 58 28.10	9.707	12 22 25.7	51.98	14 16.72	0.149	21 44 11.38
Thur.	18	22 2 20.71	9.677	12 1 32.5	52.46	14 12.78	0.179	21 48 7.94
Frid.	19	22 6 12.61	9.648	11 40 27.8	+ 52.93	14 8.13	0.209	21 52 4.49
Sat.	20	22 10 3.81	9.619	11 19 12.1	53.38	14 2.77	0.238	21 56 1.04
SUN.	21	22 13 54.33	9.591	10 57 45.8	53.81	13 56.73	0.266	21 59 57.60
Mon.	22	22 17 44.17	9.563	10 36 9.4	+ 54.22	13 50.02	0.294	22 3 54.15
Tues.	23	22 21 33.34	9.535	10 14 23.3	54.62	13 42.64	0.321	22 7 50.70
Wed.	24	22 25 21.87	9.508	9 52 27.9	55.00	13 34.61	0.348	22 11 47.26
Thur.	25	22 29 9.76	9.482	9 30 23.6	+ 55.36	13 25.95	0.374	22 15 43.81
Frid.	26	22 32 57.03	9.457	9 8 10.7	55.71	13 16.67	0.399	22 19 40.36
Sat.	27	22 36 43.70	9.433	8 45 49.8	56.04	13 6.79	0.424	22 23 36.91
SUN.	28	22 40 29.80	9.409	8 23 21.2	56.35	12 56.33	0.447	22 27 33.47
Mon.	29	22 44 15.33	9.386	8 0 45.2	56.64	12 45.31	0.470	22 31 30.02
Tues.	30	22 48 0.32	9.364	S. 7 38 2.3	+ 56.93	12 33.75	0.493	22 35 26.57

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.  
The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

Diff. for 1 Hour.  
+ 9<sup>s</sup>.8565.  
(Table III.)

AT GREENWICH MEAN NOON.								
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		$\lambda$	$\lambda'$					
1	32	311 13 42.9	13 37.2	152.18	— 0.46	9.993 5989	+ 26.3	h m s 3 18 20.90
2	33	312 14 34.6	14 28.9	152.13	0.36	9.993 6633	27.4	3 14 24.99
3	34	313 15 25.3	15 19.4	152.09	0.25	9.993 7303	28.5	3 10 29.08
4	35	314 16 15.0	16 9.0	152.05	— 0.13	9.993 7998	+ 29.5	3 6 33.17
5	36	315 17 3.8	16 57.7	152.01	0.00	9.993 8717	30.4	3 2 37.26
6	37	316 17 51.6	17 45.4	151.97	+ 0.14	9.993 9459	31.3	2 58 41.35
7	38	317 18 38.5	18 32.2	151.93	+ 0.25	9.994 0222	+ 32.2	2 54 45.45
8	39	318 19 24.5	19 18.0	151.89	0.34	9.994 1004	33.0	2 50 49.54
9	40	319 20 9.5	20 2.9	151.85	0.40	9.994 1803	33.7	2 46 53.63
10	41	320 20 53.4	20 46.7	151.81	+ 0.45	9.994 2619	+ 34.3	2 42 57.72
11	42	321 21 36.2	21 29.4	151.76	0.46	9.994 3450	34.9	2 39 1.81
12	43	322 22 17.9	22 11.0	151.71	0.46	9.994 4295	35.5	2 35 5.90
13	44	323 22 58.4	22 51.4	151.66	+ 0.42	9.994 5152	+ 36.0	2 31 10.00
14	45	324 23 37.6	23 30.5	151.61	0.36	9.994 6021	36.5	2 27 14.09
15	46	325 24 15.5	24 8.2	151.55	0.27	9.994 6901	36.9	2 23 18.18
16	47	326 24 51.9	24 44.5	151.49	+ 0.16	9.994 7792	+ 37.3	2 19 22.27
17	48	327 25 26.8	25 19.3	151.42	+ 0.03	9.994 8693	37.7	2 15 26.36
18	49	328 26 0.2	25 52.6	151.36	— 0.11	9.994 9604	38.1	2 11 30.46
19	50	329 26 31.9	26 24.2	151.29	— 0.24	9.995 0525	+ 38.6	2 7 34.55
20	51	330 27 1.9	26 54.1	151.21	0.39	9.995 1456	39.0	2 3 38.64
21	52	331 27 30.0	27 22.1	151.14	0.50	9.995 2398	39.4	1 59 42.74
22	53	332 27 56.4	27 48.4	151.06	— 0.61	9.995 3350	+ 39.9	1 55 46.83
23	54	333 28 20.8	28 12.7	150.98	0.70	9.995 4313	40.4	1 51 50.92
24	55	334 28 43.3	28 35.1	150.90	0.76	9.995 5290	40.9	1 47 55.02
25	56	335 29 3.8	28 55.5	150.81	— 0.79	9.995 6279	+ 41.5	1 43 59.11
26	57	336 29 22.3	29 13.9	150.73	0.78	9.995 7282	42.1	1 40 3.20
27	58	337 29 38.7	29 30.3	150.64	0.76	9.995 8301	42.8	1 36 7.30
28	59	338 29 53.2	29 44.6	150.56	— 0.69	9.995 9336	+ 43.5	1 32 11.39
29	60	339 30 5.7	29 57.0	150.48	0.59	9.996 0389	44.2	1 28 15.48
30	61	340 30 16.3	30 7.5	150.40	— 0.48	9.996 1459	+ 45.0	1 24 19.58
NOTE.—The longitudes in the column $\lambda$ are referred to the true equinox of their own date, while those in the column $\lambda'$ are referred to the mean equinox of the beginning of the Besselian fictitious year.								Diff. for 1 Hour, — 9 <sup>s</sup> .8296. (Table II.)



## GREENWICH MEAN TIME.

## THE MOON'S

Day of the Month.									
	SEMI- DIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
1	16 45.7	16 46.4	61 25.1	+ 0.43	61 27.8	0.00	h m	m	d
2	16 45.7	16 43.6	61 25.2	- 0.42	61 17.6	- 0.83	12 28.3	2.47	14.8
3	16 40.2	16 35.7	61 5.2	1.21	60 48.5	1.55	13 26.7	2.39	15.8
4	16 30.1	16 23.8	60 28.1	- 1.82	60 4.7	- 2.04	14 22.9	2.29	16.8
5	16 16.8	16 9.4	59 39.1	2.20	59 11.9	2.30	15 16.9	2.21	17.8
6	16 1.8	15 54.1	58 43.9	2.34	58 15.6	2.34	16 9.3	2.16	18.8
7	15 46.5	15 39.1	57 47.7	- 2.29	57 20.6	- 2.21	17 0.5	2.12	19.8
8	15 32.0	15 25.3	56 54.6	2.10	56 30.1	1.97	17 51.0	2.10	20.8
9	15 19.1	15 13.4	56 7.3	1.83	55 46.3	1.67	18 41.1	2.08	21.8
10	15 8.2	15 3.6	55 27.2	- 1.51	55 10.1	- 1.35	19 30.8	2.06	22.8
11	14 59.4	14 55.8	54 54.9	1.18	54 41.6	1.03	20 20.1	2.04	23.8
12	14 52.7	14 50.1	54 30.2	0.88	54 20.5	0.73	21 8.8	2.01	24.8
13	14 47.9	14 46.2	54 12.6	- 0.59	54 6.2	- 0.46	21 56.5	1.97	25.8
14	14 44.9	14 43.9	54 1.4	0.34	53 58.0	- 0.22	22 43.1	1.91	26.8
15	14 43.4	14 43.2	53 56.0	- 0.11	53 55.3	0.00	23 28.4	1.86	27.8
16	14 43.4	14 43.9	53 55.9	+ 0.10	53 57.8	+ 0.21	0 6		28.8
17	14 44.7	14 45.9	54 1.0	0.31	54 5.4	0.43	0 12.6	1.82	0.0
18	14 47.5	14 49.5	54 11.2	0.54	54 18.3	0.65	0 55.9	1.79	1.0
19	14 51.8	14 54.5	54 26.9	+ 0.78	54 37.0	+ 0.90	1 38.7	1.78	2.0
20	14 57.7	15 1.4	54 48.7	1.04	55 2.0	1.18	2 21.6	1.79	3.0
21	15 5.5	15 10.0	55 17.1	1.33	55 33.9	1.47	3 5.0	1.83	4.0
22	15 15.1	15 20.6	55 52.4	+ 1.62	56 12.7	+ 1.75	3 49.7	1.90	5.0
23	15 26.6	15 33.0	56 34.6	1.89	56 58.1	2.01	4 36.2	1.99	6.0
24	15 39.7	15 46.8	57 22.9	2.11	57 48.8	2.19	5 25.2	2.10	7.0
25	15 54.0	16 1.4	58 15.4	+ 2.23	58 42.4	+ 2.24	6 17.1	2.22	8.0
26	16 8.7	16 15.8	59 9.2	2.20	59 35.3	2.11	7 11.9	2.33	9.0
27	16 22.5	16 28.7	59 59.9	1.97	60 22.5	1.76	8 9.1	2.42	10.0
28	16 34.0	16 38.5	60 42.3	+ 1.50	60 58.6	+ 1.19	9 8.0	2.47	11.0
29	16 41.8	16 44.0	61 10.9	0.83	61 18.7	+ 0.44	10 7.4	2.47	12.0
30	16 44.7	16 44.2	61 21.6	+ 0.03	61 19.4	- 0.39	11 6.3	2.43	13.0
31	16 42.1	16 38.9	61 12.2	- 0.80	61 0.2	1.18	12 3.9	2.37	14.0
32	16 34.4	16 28.9	60 43.7	- 1.53	60 23.4	- 1.83	13 0.1	2.31	15.0
							13 54.9	2.26	16.0

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 1.					WEDNESDAY 3.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	8 39 31.28	2.5776	N. 14 20 29.8	7.631	0	10 39 46.29	2.4228	N. 6 37 12.5	11.102
1	8 42 5.87	2.5752	14 12 48.8	7.737	1	10 42 11.55	2.4192	6 26 5.3	11.137
2	8 44 40.31	2.5728	14 5 1.4	7.841	2	10 44 36.60	2.4157	6 14 56.0	11.171
3	8 47 14.61	2.5705	13 57 7.9	7.943	3	10 47 1.43	2.4121	6 3 44.8	11.203
4	8 49 48.77	2.5680	13 49 8.2	8.045	4	10 49 26.05	2.4086	5 52 31.7	11.233
5	8 52 22.77	2.5653	13 41 2.5	8.145	5	10 51 50.46	2.4051	5 41 16.9	11.261
6	8 54 56.61	2.5627	13 32 50.8	8.244	6	10 54 14.66	2.4016	5 30 0.4	11.289
7	8 57 30.30	2.5601	13 24 33.2	8.342	7	10 56 38.65	2.3982	5 18 42.2	11.315
8	9 0 3.82	2.5573	13 16 9.7	8.439	8	10 59 2.44	2.3947	5 7 22.6	11.338
9	9 2 37.18	2.5546	13 7 40.5	8.534	9	11 1 26.02	2.3913	4 56 1.6	11.361
10	9 5 10.37	2.5517	12 59 5.6	8.628	10	11 3 49.39	2.3878	4 44 39.3	11.382
11	9 7 43.39	2.5488	12 50 25.1	8.721	11	11 6 12.55	2.3843	4 33 15.7	11.402
12	9 10 16.23	2.5459	12 41 39.1	8.813	12	11 8 35.51	2.3810	4 21 51.1	11.419
13	9 12 48.90	2.5429	12 32 47.6	8.903	13	11 10 58.27	2.3776	4 10 25.4	11.436
14	9 15 21.38	2.5399	12 23 50.8	8.991	14	11 13 20.82	2.3742	3 58 58.8	11.451
15	9 17 53.69	2.5369	12 14 48.7	9.078	15	11 15 43.17	2.3709	3 47 31.3	11.465
16	9 20 25.81	2.5338	12 5 41.5	9.163	16	11 18 5.33	2.3676	3 36 3.0	11.477
17	9 22 57.74	2.5306	11 56 29.1	9.248	17	11 20 27.28	2.3643	3 24 34.0	11.488
18	9 25 29.48	2.5274	11 47 11.8	9.330	18	11 22 49.04	2.3611	3 13 4.4	11.497
19	9 28 1.03	2.5242	11 37 49.5	9.412	19	11 25 10.61	2.3578	3 1 34.3	11.505
20	9 30 32.38	2.5209	11 28 22.4	9.492	20	11 27 31.98	2.3546	2 50 3.8	11.512
21	9 33 3.54	2.5177	11 18 50.5	9.570	21	11 29 53.16	2.3514	2 38 32.9	11.517
22	9 35 34.50	2.5144	11 9 14.0	9.647	22	11 32 14.15	2.3482	2 27 1.7	11.521
23	9 38 5.27	2.5111	N. 10 59 32.9	9.722	23	11 34 34.94	2.3450	N. 2 15 30.4	11.523
TUESDAY 2.					THURSDAY 4.				
0	9 40 35.83	2.5077	N. 10 49 47.4	9.795	0	11 36 55.55	2.3419	N. 2 3 58.9	11.524
1	9 43 6.19	2.5043	10 39 57.5	9.868	1	11 39 15.97	2.3388	1 52 27.5	11.523
2	9 45 36.35	2.5009	10 30 3.3	9.939	2	11 41 36.21	2.3358	1 40 56.1	11.522
3	9 48 6.30	2.4974	10 20 4.8	10.008	3	11 43 56.27	2.3328	1 29 24.9	11.518
4	9 50 36.04	2.4940	10 10 2.3	10.075	4	11 46 16.14	2.3298	1 17 53.9	11.514
5	9 53 5.58	2.4905	9 59 55.8	10.142	5	11 48 35.84	2.3268	1 6 23.2	11.508
6	9 55 34.90	2.4870	9 49 45.3	10.207	6	11 50 55.36	2.3238	0 54 52.9	11.501
7	9 58 4.02	2.4836	9 39 31.0	10.269	7	11 53 14.70	2.3209	0 43 23.1	11.493
8	10 0 32.93	2.4800	9 29 13.0	10.331	8	11 55 33.87	2.3181	0 31 53.8	11.483
9	10 3 1.62	2.4764	9 18 51.3	10.391	9	11 57 52.87	2.3153	0 20 25.2	11.472
10	10 5 30.10	2.4729	9 8 26.1	10.449	10	12 0 11.70	2.3124	N. 0 8 57.2	11.460
11	10 7 58.37	2.4693	8 57 57.4	10.507	11	12 2 30.36	2.3097	S. 0 2 30.0	11.446
12	10 10 26.42	2.4658	8 47 25.3	10.562	12	12 4 48.86	2.3069	0 13 56.3	11.431
13	10 12 54.26	2.4622	8 36 50.0	10.615	13	12 7 7.19	2.3042	0 25 21.7	11.415
14	10 15 21.88	2.4586	8 26 11.5	10.667	14	12 9 25.36	2.3015	0 36 46.1	11.397
15	10 17 49.29	2.4550	8 15 29.9	10.718	15	12 11 43.37	2.2989	0 48 9.4	11.378
16	10 20 16.48	2.4514	8 4 45.3	10.767	16	12 14 1.23	2.2963	0 59 31.5	11.358
17	10 22 43.46	2.4478	7 53 57.9	10.814	17	12 16 18.93	2.2937	1 10 52.4	11.338
18	10 25 10.22	2.4443	7 43 7.6	10.860	18	12 18 36.47	2.2911	1 22 12.0	11.316
19	10 27 36.77	2.4407	7 32 14.7	10.904	19	12 20 53.86	2.2886	1 33 30.3	11.293
20	10 30 3.10	2.4371	7 21 19.1	10.947	20	12 23 11.10	2.2862	1 44 47.1	11.268
21	10 32 29.22	2.4335	7 10 21.0	10.989	21	12 25 28.20	2.2837	1 56 2.4	11.242
22	10 34 55.12	2.4299	6 59 20.4	11.028	22	12 27 45.14	2.2812	2 7 16.2	11.216
23	10 37 20.81	2.4264	6 48 17.6	11.066	23	12 30 1.94	2.2788	2 18 28.3	11.187
24	10 39 46.29	2.4228	N. 6 37 12.5	11.102	24	12 32 18.60	2.2765	S. 2 29 38.7	11.158

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 5.					SUNDAY 7.				
0	12 32 18.60	2.2765	S. 2 29 38.7	11.158	0	14 19 29.96	2.2013	S. 10 33 37.7	8.693
1	12 34 35.12	2.2742	2 40 47.3	11.128	1	14 21 42.01	2.2003	10 42 17.2	8.623
2	12 36 51.50	2.2719	2 51 54.1	11.097	2	14 23 54.00	2.1995	10 50 52.5	8.553
3	12 39 7.75	2.2697	3 2 59.0	11.065	3	14 26 5.95	2.1987	10 59 23.5	8.483
4	12 41 23.86	2.2674	3 14 1.9	11.032	4	14 28 17.84	2.1978	11 7 50.4	8.412
5	12 43 39.84	2.2653	3 25 2.8	10.998	5	14 30 29.68	2.1969	11 16 13.0	8.340
6	12 45 55.69	2.2631	3 36 1.6	10.962	6	14 32 41.47	2.1962	11 24 31.2	8.268
7	12 48 11.41	2.2610	3 46 58.2	10.925	7	14 34 53.22	2.1954	11 32 45.1	8.196
8	12 50 27.01	2.2589	3 57 52.6	10.888	8	14 37 4.92	2.1946	11 40 54.7	8.123
9	12 52 42.48	2.2568	4 8 44.8	10.850	9	14 39 16.57	2.1938	11 48 59.9	8.049
10	12 54 57.83	2.2548	4 19 34.6	10.810	10	14 41 28.18	2.1931	11 57 0.6	7.975
11	12 57 13.06	2.2529	4 30 22.0	10.770	11	14 43 39.74	2.1923	12 4 56.9	7.901
12	12 59 28.18	2.2510	4 41 7.0	10.728	12	14 45 51.26	2.1917	12 12 48.7	7.826
13	13 1 43.18	2.2491	4 51 49.4	10.686	13	14 48 2.74	2.1910	12 20 36.0	7.750
14	13 3 58.07	2.2472	5 2 29.3	10.643	14	14 50 14.18	2.1903	12 28 18.7	7.674
15	13 6 12.84	2.2453	5 13 6.6	10.599	15	14 52 25.58	2.1897	12 35 56.9	7.598
16	13 8 27.51	2.2436	5 23 41.2	10.554	16	14 54 36.94	2.1890	12 43 30.5	7.522
17	13 10 42.07	2.2417	5 34 13.1	10.508	17	14 56 48.26	2.1883	12 50 59.5	7.444
18	13 12 56.52	2.2400	5 44 42.2	10.461	18	14 58 59.54	2.1877	12 58 23.8	7.366
19	13 15 10.87	2.2383	5 55 8.4	10.413	19	15 1 10.78	2.1871	13 5 43.4	7.287
20	13 17 25.11	2.2366	6 5 31.7	10.364	20	15 3 21.99	2.1866	13 12 58.3	7.209
21	13 19 39.26	2.2350	6 15 52.1	10.315	21	15 5 33.17	2.1860	13 20 8.5	7.131
22	13 21 53.31	2.2333	6 26 9.5	10.265	22	15 7 44.31	2.1853	13 27 14.0	7.052
23	13 24 7.26	2.2318	S. 6 36 23.9	10.213	23	15 9 55.41	2.1848	S. 13 34 14.7	6.972
SATURDAY 6.					MONDAY 8.				
0	13 26 21.12	2.2301	S. 6 46 35.1	10.161	0	15 12 6.48	2.1843	S. 13 41 10.6	6.892
1	13 28 34.89	2.2287	6 56 43.2	10.108	1	15 14 17.52	2.1837	13 48 1.7	6.812
2	13 30 48.56	2.2272	7 6 48.1	10.055	2	15 16 28.52	2.1832	13 54 48.0	6.731
3	13 33 2.15	2.2258	7 16 49.8	10.001	3	15 18 39.50	2.1827	14 1 29.4	6.649
4	13 35 15.65	2.2243	7 26 48.2	9.945	4	15 20 50.44	2.1821	14 8 5.9	6.568
5	13 37 29.07	2.2229	7 36 43.2	9.889	5	15 23 1.35	2.1816	14 14 37.5	6.486
6	13 39 42.40	2.2215	7 46 34.9	9.833	6	15 25 12.23	2.1810	14 21 4.2	6.404
7	13 41 55.65	2.2202	7 56 23.1	9.775	7	15 27 23.07	2.1804	14 27 26.0	6.322
8	13 44 8.82	2.2188	8 6 7.9	9.717	8	15 29 33.88	2.1800	14 33 42.8	6.238
9	13 46 21.91	2.2176	8 15 49.1	9.658	9	15 31 44.67	2.1795	14 39 54.6	6.156
10	13 48 34.93	2.2163	8 25 26.8	9.598	10	15 33 55.42	2.1789	14 46 1.5	6.073
11	13 50 47.87	2.2150	8 35 0.9	9.538	11	15 36 6.14	2.1785	14 52 3.3	5.989
12	13 53 0.73	2.2138	8 44 31.3	9.477	12	15 38 16.84	2.1781	14 58 0.0	5.903
13	13 55 13.52	2.2127	8 53 58.1	9.415	13	15 40 27.51	2.1775	15 3 51.7	5.820
14	13 57 26.25	2.2115	9 3 21.1	9.352	14	15 42 38.14	2.1770	15 9 38.4	5.736
15	13 59 38.90	2.2103	9 12 40.4	9.289	15	15 44 48.75	2.1766	15 15 20.0	5.650
16	14 1 51.49	2.2093	9 21 55.8	9.225	16	15 46 59.33	2.1761	15 20 56.4	5.565
17	14 4 4.01	2.2082	9 31 7.4	9.161	17	15 49 9.88	2.1756	15 26 27.8	5.480
18	14 6 16.47	2.2072	9 40 15.1	9.096	18	15 51 20.40	2.1751	15 31 54.0	5.394
19	14 8 28.87	2.2061	9 49 18.9	9.030	19	15 53 30.89	2.1746	15 37 15.1	5.308
20	14 10 41.20	2.2051	9 58 18.7	8.964	20	15 55 41.35	2.1740	15 42 31.0	5.223
21	14 12 53.48	2.2042	10 7 14.6	8.898	21	15 57 51.77	2.1735	15 47 41.8	5.136
22	14 15 5.70	2.2032	10 16 6.4	8.829	22	16 0 2.17	2.1731	15 52 47.3	5.049
23	14 17 17.86	2.2022	10 24 54.1	8.761	23	16 2 12.54	2.1726	15 57 47.7	4.962
24	14 19 29.96	2.2013	S. 10 33 37.7	8.693	24	16 4 22.88	2.1721	S. 16 2 42.8	4.875

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 9.					THURSDAY 11.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	16 4 22.88	2.1721	S. 16 2 42.8	4.875	0	17 47 53.65	2.1358	S. 18 14 16.2	0.591
1	16 6 33.19	2.1716	16 7 32.7	4.788	1	17 50 1.77	2.1348	18 14 49.0	0.502
2	16 8 43.47	2.1711	16 12 17.4	4.701	2	17 52 9.83	2.1337	18 15 16.5	0.413
3	16 10 53.72	2.1706	16 16 56.8	4.613	3	17 54 17.82	2.1325	18 15 38.6	0.324
4	16 13 3.94	2.1700	16 21 31.0	4.526	4	17 56 25.73	2.1313	18 15 55.4	0.236
5	16 15 14.12	2.1694	16 25 59.9	4.438	5	17 58 33.58	2.1302	18 16 6.9	0.148
6	16 17 24.27	2.1690	16 30 23.6	4.350	6	18 0 41.35	2.1289	18 16 13.2	-0.060
7	16 19 34.40	2.1685	16 34 41.9	4.262	7	18 2 49.05	2.1277	18 16 14.1	+0.029
8	16 21 44.49	2.1678	16 38 55.0	4.173	8	18 4 56.68	2.1265	18 16 9.7	0.117
9	16 23 54.54	2.1673	16 43 2.7	4.084	9	18 7 4.23	2.1253	18 16 0.1	0.204
10	16 26 4.56	2.1668	16 47 5.1	3.996	10	18 9 11.71	2.1240	18 15 45.2	0.292
11	16 28 14.55	2.1663	16 51 2.2	3.908	11	18 11 19.11	2.1226	18 15 25.0	0.379
12	16 30 24.51	2.1657	16 54 54.0	3.818	12	18 13 26.42	2.1213	18 14 59.7	0.466
13	16 32 34.43	2.1650	16 58 40.4	3.729	13	18 15 33.66	2.1200	18 14 29.1	0.553
14	16 34 44.31	2.1644	17 2 21.5	3.641	14	18 17 40.82	2.1187	18 13 53.3	0.640
15	16 36 54.16	2.1638	17 5 57.3	3.552	15	18 19 47.90	2.1173	18 13 12.3	0.728
16	16 39 3.97	2.1632	17 9 27.7	3.462	16	18 21 54.89	2.1158	18 12 26.0	0.814
17	16 41 13.74	2.1625	17 12 52.7	3.372	17	18 24 1.80	2.1145	18 11 34.6	0.899
18	16 43 23.47	2.1619	17 16 12.3	3.283	18	18 26 8.63	2.1131	18 10 38.1	0.985
19	16 45 33.17	2.1613	17 19 26.6	3.193	19	18 28 15.37	2.1116	18 9 36.4	1.072
20	16 47 42.82	2.1605	17 22 35.5	3.103	20	18 30 22.02	2.1102	18 8 29.5	1.158
21	16 49 52.43	2.1599	17 25 39.0	3.013	21	18 32 28.59	2.1088	18 7 17.5	1.243
22	16 52 2.01	2.1592	17 28 37.1	2.924	22	18 34 35.07	2.1073	18 6 0.4	1.328
23	16 54 11.54	2.1584	S. 17 31 29.9	2.835	23	18 36 41.46	2.1057	S. 18 4 38.2	1.413
WEDNESDAY 10.					FRIDAY 12.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	16 56 21.02	2.1578	S. 17 34 17.3	2.745	0	18 38 47.75	2.1042	S. 18 3 10.9	1.498
1	16 58 30.47	2.1571	17 36 59.3	2.654	1	18 40 53.96	2.1027	18 1 38.5	1.582
2	17 0 39.87	2.1563	17 39 35.8	2.564	2	18 43 0.07	2.1011	18 0 1.1	1.666
3	17 2 49.23	2.1556	17 42 7.0	2.475	3	18 45 6.09	2.0995	17 58 18.6	1.750
4	17 4 58.54	2.1547	17 44 32.8	2.385	4	18 47 12.01	2.0979	17 56 31.1	1.833
5	17 7 7.80	2.1540	17 46 53.2	2.295	5	18 49 17.84	2.0963	17 54 38.6	1.917
6	17 9 17.02	2.1532	17 49 8.2	2.204	6	18 51 23.57	2.0947	17 52 41.1	2.000
7	17 11 26.18	2.1523	17 51 17.7	2.114	7	18 53 29.20	2.0930	17 50 38.6	2.082
8	17 13 35.30	2.1516	17 53 21.9	2.025	8	18 55 34.73	2.0914	17 48 31.2	2.164
9	17 15 44.37	2.1508	17 55 20.7	1.934	9	18 57 40.17	2.0898	17 46 18.9	2.247
10	17 17 53.39	2.1498	17 57 14.0	1.844	10	18 59 45.51	2.0881	17 44 1.6	2.329
11	17 20 2.35	2.1489	17 59 2.0	1.755	11	19 1 50.74	2.0863	17 41 39.4	2.410
12	17 22 11.26	2.1481	18 0 44.6	1.665	12	19 3 55.87	2.0847	17 39 12.4	2.491
13	17 24 20.12	2.1472	18 2 21.8	1.575	13	19 6 0.90	2.0830	17 36 40.5	2.572
14	17 26 28.92	2.1462	18 3 53.6	1.485	14	19 8 5.83	2.0813	17 34 3.8	2.653
15	17 28 37.66	2.1453	18 5 20.0	1.396	15	19 10 10.65	2.0795	17 31 22.2	2.733
16	17 30 46.35	2.1443	18 6 41.1	1.307	16	19 12 15.37	2.0778	17 28 35.8	2.813
17	17 32 54.98	2.1433	18 7 56.8	1.217	17	19 14 19.98	2.0760	17 25 44.6	2.893
18	17 35 3.55	2.1423	18 9 7.1	1.127	18	19 16 24.49	2.0742	17 22 48.7	2.972
19	17 37 12.06	2.1413	18 10 12.0	1.037	19	19 18 28.89	2.0724	17 19 48.0	3.051
20	17 39 20.51	2.1403	18 11 11.6	0.948	20	19 20 33.18	2.0706	17 16 42.6	3.129
21	17 41 28.89	2.1392	18 12 5.8	0.858	21	19 22 37.36	2.0688	17 13 32.5	3.208
22	17 43 37.21	2.1382	18 12 54.6	0.769	22	19 24 41.44	2.0670	17 10 17.7	3.286
23	17 45 45.47	2.1370	18 13 38.1	0.680	23	19 26 45.40	2.0651	17 6 58.2	3.362
24	17 47 53.65	2.1358	S. 18 14 16.2	0.591	24	19 28 49.25	2.0633	S. 17 3 34.2	3.439

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 13.					MONDAY 15.				
0	19 28 49.25	2.0633	S. 17 3 34.2	3.499	0	21 5 38.88	1.9714	S. 12 57 30.9	6.637
1	19 30 52.99	2.0614	17 0 5.5	3.517	1	21 7 37.11	1.9696	12 50 51.0	6.692
2	19 32 56.62	2.0596	16 56 32.2	3.593	2	21 9 35.23	1.9678	12 44 7.9	6.746
3	19 35 0.14	2.0578	16 52 54.3	3.669	3	21 11 33.24	1.9660	12 37 21.5	6.800
4	19 37 3.55	2.0558	16 49 11.9	3.744	4	21 13 31.15	1.9642	12 30 31.9	6.853
5	19 39 6.84	2.0539	16 45 25.0	3.820	5	21 15 28.95	1.9624	12 23 39.2	6.905
6	19 41 10.02	2.0520	16 41 33.5	3.895	6	21 17 26.64	1.9607	12 16 43.3	6.957
7	19 43 13.08	2.0501	16 37 37.6	3.969	7	21 19 24.23	1.9590	12 9 44.3	7.009
8	19 45 16.03	2.0483	16 33 37.2	4.043	8	21 21 21.72	1.9573	12 2 42.2	7.061
9	19 47 18.87	2.0463	16 29 32.4	4.117	9	21 23 19.10	1.9555	11 55 37.0	7.112
10	19 49 21.59	2.0444	16 25 23.2	4.190	10	21 25 16.38	1.9538	11 48 28.8	7.162
11	19 51 24.20	2.0426	16 21 9.6	4.263	11	21 27 13.56	1.9521	11 41 17.6	7.211
12	19 53 26.70	2.0407	16 16 51.6	4.336	12	21 29 10.63	1.9504	11 34 3.5	7.259
13	19 55 29.08	2.0387	16 12 29.3	4.408	13	21 31 7.61	1.9488	11 26 46.5	7.308
14	19 57 31.34	2.0367	16 8 2.7	4.479	14	21 33 4.49	1.9473	11 19 26.5	7.357
15	19 59 33.48	2.0348	16 3 31.8	4.550	15	21 35 1.28	1.9457	11 12 3.7	7.404
16	20 1 35.51	2.0328	15 58 56.7	4.620	16	21 36 57.97	1.9440	11 4 38.0	7.451
17	20 3 37.42	2.0308	15 54 17.4	4.691	17	21 38 54.56	1.9424	10 57 9.6	7.497
18	20 5 39.21	2.0289	15 49 33.8	4.761	18	21 40 51.66	1.9409	10 49 38.4	7.543
19	20 7 40.89	2.0270	15 44 46.1	4.830	19	21 42 47.47	1.9394	10 42 4.5	7.588
20	20 9 42.45	2.0250	15 39 54.2	4.899	20	21 44 43.79	1.9378	10 34 27.8	7.633
21	20 11 43.89	2.0230	15 34 58.2	4.967	21	21 46 40.01	1.9363	10 26 48.5	7.677
22	20 13 45.21	2.0211	15 29 58.1	5.035	22	21 48 36.14	1.9348	10 19 6.6	7.720
23	20 15 46.42	2.0192	S. 15 24 54.0	5.102	23	21 50 32.19	1.9334	S. 10 11 22.1	7.764
SUNDAY 14.					TUESDAY 16.				
0	20 17 47.51	2.0172	S. 15 19 45.8	5.170	0	21 52 28.15	1.9319	S. 10 3 34.9	7.807
1	20 19 48.48	2.0153	15 14 33.6	5.237	1	21 54 24.02	1.9305	9 55 45.3	7.848
2	20 21 49.34	2.0133	15 9 17.4	5.303	2	21 56 19.81	1.9292	9 47 53.1	7.890
3	20 23 50.08	2.0113	15 3 57.3	5.368	3	21 58 15.52	1.9278	9 39 58.5	7.931
4	20 25 50.70	2.0093	14 58 33.2	5.434	4	22 0 11.15	1.9264	9 32 1.4	7.971
5	20 27 51.20	2.0074	14 53 5.2	5.498	5	22 2 6.69	1.9251	9 24 2.0	8.010
6	20 29 51.59	2.0055	14 47 33.4	5.563	6	22 4 2.16	1.9238	9 16 0.2	8.050
7	20 31 51.86	2.0036	14 41 57.7	5.627	7	22 5 57.55	1.9225	9 7 56.0	8.088
8	20 33 52.02	2.0016	14 36 18.2	5.690	8	22 7 52.86	1.9212	8 59 49.6	8.126
9	20 35 52.05	1.9996	14 30 34.9	5.753	9	22 9 48.10	1.9200	8 51 40.9	8.164
10	20 37 51.97	1.9978	14 24 47.8	5.816	10	22 11 43.26	1.9188	8 43 29.9	8.202
11	20 39 51.78	1.9958	14 18 57.0	5.877	11	22 13 38.35	1.9176	8 35 16.7	8.238
12	20 41 51.47	1.9938	14 13 2.5	5.939	12	22 15 33.37	1.9164	8 27 1.3	8.274
13	20 43 51.04	1.9919	14 7 4.3	6.000	13	22 17 28.32	1.9153	8 18 43.8	8.309
14	20 45 50.50	1.9901	14 1 2.5	6.060	14	22 19 23.20	1.9142	8 10 24.2	8.343
15	20 47 49.85	1.9882	13 54 57.1	6.120	15	22 21 18.02	1.9131	8 2 2.6	8.378
16	20 49 49.08	1.9863	13 48 48.1	6.179	16	22 23 12.77	1.9120	7 53 38.9	8.412
17	20 51 48.20	1.9843	13 42 35.6	6.238	17	22 25 7.46	1.9110	7 45 13.2	8.445
18	20 53 47.20	1.9824	13 36 19.5	6.297	18	22 27 2.09	1.9100	7 36 45.5	8.477
19	20 55 46.09	1.9806	13 29 59.9	6.355	19	22 28 56.66	1.9090	7 28 15.9	8.509
20	20 57 44.87	1.9788	13 23 36.9	6.412	20	22 30 51.17	1.9080	7 19 44.4	8.541
21	20 59 43.54	1.9769	13 17 10.5	6.468	21	22 32 45.62	1.9071	7 11 11.0	8.572
22	21 1 42.10	1.9750	13 10 40.7	6.526	22	22 34 40.02	1.9062	7 2 35.8	8.602
23	21 3 40.54	1.9732	13 4 7.4	6.582	23	22 36 34.37	1.9053	6 53 58.8	8.632
24	21 5 38.88	1.9714	S. 12 57 30.9	6.637	24	22 38 28.66	1.9044	S. 6 45 20.0	8.661

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 17.					FRIDAY 19.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	22 38 28.66	1.9044	S. 6 45 20.0	8.661	0	0 9 32.05	1.9030	N. 0 33 9.2	9.388
1	22 40 22.90	1.9037	6 36 39.5	8.689	1	0 11 26.26	1.9039	0 42 32.5	9.389
2	22 42 17.10	1.9029	6 27 57.3	8.718	2	0 13 20.52	1.9048	0 51 55.9	9.390
3	22 44 11.25	1.9022	6 19 13.4	8.745	3	0 15 14.84	1.9058	1 1 19.3	9.389
4	22 46 5.36	1.9014	6 10 27.9	8.772	4	0 17 9.21	1.9068	1 10 42.6	9.388
5	22 47 59.42	1.9007	6 1 40.8	8.798	5	0 19 3.65	1.9078	1 20 5.9	9.387
6	22 49 53.44	1.9001	5 52 52.2	8.823	6	0 20 58.15	1.9088	1 29 29.0	9.384
7	22 51 47.43	1.8995	5 44 2.0	8.849	7	0 22 52.71	1.9100	1 38 52.0	9.382
8	22 53 41.38	1.8988	5 35 10.3	8.874	8	0 24 47.35	1.9112	1 48 14.9	9.379
9	22 55 35.29	1.8983	5 26 17.1	8.898	9	0 26 42.05	1.9123	1 57 37.5	9.375
10	22 57 29.17	1.8978	5 17 22.5	8.922	10	0 28 36.83	1.9136	2 6 59.9	9.371
11	22 59 23.02	1.8972	5 8 26.5	8.944	11	0 30 31.68	1.9148	2 16 22.0	9.365
12	23 1 16.83	1.8967	4 59 29.2	8.966	12	0 32 26.61	1.9162	2 25 43.7	9.359
13	23 3 10.62	1.8963	4 50 30.6	8.988	13	0 34 21.62	1.9175	2 35 5.1	9.353
14	23 5 4.39	1.8959	4 41 30.7	9.009	14	0 36 16.71	1.9189	2 44 26.1	9.347
15	23 6 58.13	1.8955	4 32 29.5	9.030	15	0 38 11.89	1.9203	2 53 46.7	9.339
16	23 8 51.85	1.8952	4 23 27.1	9.050	16	0 40 7.15	1.9218	3 3 6.8	9.331
17	23 10 45.55	1.8948	4 14 23.5	9.070	17	0 42 2.51	1.9234	3 12 26.4	9.322
18	23 12 39.23	1.8946	4 5 18.7	9.089	18	0 43 57.96	1.9249	3 21 45.5	9.313
19	23 14 32.90	1.8943	3 56 12.8	9.107	19	0 45 53.50	1.9265	3 31 4.0	9.303
20	23 16 26.55	1.8941	3 47 5.9	9.124	20	0 47 49.14	1.9282	3 40 21.8	9.292
21	23 18 20.19	1.8939	3 37 57.9	9.142	21	0 49 44.89	1.9299	3 49 39.0	9.281
22	23 20 13.82	1.8938	3 28 48.8	9.159	22	0 51 40.73	1.9316	3 58 55.5	9.269
23	23 22 7.45	1.8938	S. 3 19 38.8	9.175	23	0 53 36.68	1.9333	N. 4 8 11.3	9.257
THURSDAY 18.					SATURDAY 20.				
0	23 24 1.07	1.8937	S. 3 10 27.8	9.191	0	0 55 32.73	1.9352	N. 4 17 26.3	9.243
1	23 25 54.69	1.8936	3 1 15.9	9.205	1	0 57 28.90	1.9371	4 26 40.5	9.229
2	23 27 48.30	1.8936	2 52 3.2	9.219	2	0 59 25.18	1.9389	4 35 53.8	9.215
3	23 29 41.92	1.8937	2 42 49.6	9.233	3	1 1 21.57	1.9408	4 45 6.3	9.200
4	23 31 35.54	1.8938	2 33 35.2	9.247	4	1 3 18.08	1.9428	4 54 17.8	9.184
5	23 33 29.17	1.8938	2 24 20.0	9.259	5	1 5 14.71	1.9449	5 3 28.4	9.168
6	23 35 22.80	1.8939	2 15 4.1	9.271	6	1 7 11.47	1.9470	5 12 38.0	9.152
7	23 37 16.44	1.8942	2 5 47.5	9.283	7	1 9 8.35	1.9491	5 21 46.6	9.134
8	23 39 10.10	1.8944	1 56 30.2	9.294	8	1 11 5.36	1.9512	5 30 54.1	9.116
9	23 41 3.77	1.8946	1 47 12.2	9.304	9	1 13 2.49	1.9533	5 40 0.5	9.097
10	23 42 57.45	1.8949	1 37 53.7	9.313	10	1 14 59.76	1.9557	5 49 5.7	9.077
11	23 44 51.16	1.8953	1 28 34.6	9.322	11	1 16 57.17	1.9579	5 58 9.8	9.057
12	23 46 44.88	1.8956	1 19 15.0	9.331	12	1 18 54.71	1.9602	6 7 12.6	9.037
13	23 48 38.63	1.8960	1 9 54.9	9.339	13	1 20 52.39	1.9626	6 16 14.2	9.015
14	23 50 32.40	1.8964	1 0 34.3	9.347	14	1 22 50.22	1.9650	6 25 14.4	8.993
15	23 52 26.20	1.8970	0 51 13.3	9.353	15	1 24 48.19	1.9674	6 34 13.3	8.970
16	23 54 20.04	1.8975	0 41 51.9	9.360	16	1 26 46.31	1.9699	6 43 10.8	8.947
17	23 56 13.90	1.8980	0 32 30.1	9.366	17	1 28 44.58	1.9724	6 52 6.9	8.923
18	23 58 7.80	1.8987	0 23 8.0	9.371	18	1 30 43.00	1.9750	7 1 1.5	8.898
19	0 0 1.74	1.8993	0 13 45.6	9.375	19	1 32 41.58	1.9776	7 9 54.6	8.873
20	0 1 55.71	1.8999	S. 0 4 23.0	9.378	20	1 34 40.31	1.9802	7 18 46.2	8.847
21	0 3 49.73	1.9007	N. 0 4 59.8	9.382	21	1 36 39.20	1.9829	7 27 36.2	8.820
22	0 5 43.79	1.9014	0 14 22.8	9.385	22	1 38 38.26	1.9857	7 36 24.6	8.792
23	0 7 37.90	1.9022	0 23 46.0	9.387	23	1 40 37.48	1.9884	7 45 11.3	8.763
24	0 9 32.05	1.9030	N. 0 33 9.2	9.388	24	1 42 36.87	1.9912	N. 7 53 56.2	8.734

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 21.					TUESDAY 23.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
1	1 42 36.87	1.9912	N. 7 53 56.2	8.734	1	3 22 9.07	2.1689	N. 14 6 13.4	6.483
2	1 44 36.43	1.9941	8 2 39.4	8.705	2	3 24 19.34	2.1733	14 12 40.4	6.418
3	1 46 36.16	1.9970	8 11 20.8	8.675	3	3 26 29.87	2.1777	14 19 3.5	6.352
4	1 48 36.07	1.9999	8 20 0.4	8.644	4	3 28 40.66	2.1822	14 25 22.6	6.283
5	1 50 36.15	2.0028	8 28 38.1	8.612	5	3 30 51.73	2.1867	14 31 37.5	6.214
6	1 52 36.41	2.0058	8 37 13.9	8.580	6	3 33 3.06	2.1912	14 37 48.3	6.145
7	1 54 36.85	2.0089	8 45 47.7	8.547	7	3 35 14.67	2.1957	14 43 54.9	6.074
8	1 56 37.48	2.0121	8 54 19.5	8.513	8	3 37 26.54	2.2002	14 49 57.2	6.003
9	1 58 38.30	2.0152	9 2 49.3	8.479	9	3 39 38.69	2.2048	14 55 55.2	5.931
10	2 0 39.30	2.0183	9 11 17.0	8.444	10	3 41 51.11	2.2093	15 1 48.9	5.858
11	2 2 40.50	2.0216	9 19 42.6	8.408	11	3 44 3.80	2.2138	15 7 38.1	5.784
12	2 4 41.89	2.0248	9 28 6.0	8.372	12	3 46 16.76	2.2183	15 13 23.0	5.710
13	2 6 43.48	2.0282	9 36 27.2	8.334	13	3 48 30.00	2.2229	15 19 3.3	5.634
14	2 8 45.27	2.0315	9 44 46.1	8.296	14	3 50 43.51	2.2275	15 24 39.1	5.558
15	2 10 47.26	2.0348	9 53 2.7	8.257	15	3 52 57.30	2.2322	15 30 10.3	5.481
16	2 12 49.45	2.0382	10 1 17.0	8.218	16	3 55 11.37	2.2368	15 35 36.8	5.403
17	2 14 51.84	2.0416	10 9 28.9	8.178	17	3 57 25.71	2.2413	15 40 58.6	5.324
18	2 16 54.44	2.0452	10 17 38.4	8.137	18	4 0 40.32	2.2459	15 46 15.7	5.245
19	2 18 57.26	2.0487	10 25 45.4	8.095	19	4 1 55.22	2.2506	15 51 28.0	5.164
20	2 21 0.28	2.0522	10 33 49.8	8.052	20	4 4 10.39	2.2552	15 56 35.4	5.082
21	2 23 3.52	2.0558	10 41 51.7	8.009	21	4 6 25.84	2.2598	16 1 37.9	5.000
22	2 25 6.98	2.0594	10 49 50.9	7.965	22	4 8 41.56	2.2643	16 6 35.4	4.917
23	2 27 10.65	2.0631	10 57 47.5	7.921	23	4 10 57.56	2.2690	16 11 27.9	4.833
24	2 29 14.55	2.0668	N. 11 5 41.4	7.876	24	4 13 13.84	2.2737	N. 16 16 15.4	4.748
MONDAY 22.					WEDNESDAY 24.				
0	2 31 18.66	2.0704	N. 11 13 32.6	7.829	0	4 15 30.40	2.2783	N. 16 20 57.7	4.662
1	2 33 23.00	2.0742	11 21 20.9	7.782	1	4 17 47.24	2.2829	16 25 34.9	4.576
2	2 35 27.57	2.0781	11 29 6.4	7.734	2	4 20 4.35	2.2874	16 30 6.8	4.488
3	2 37 32.37	2.0818	11 36 49.0	7.686	3	4 22 21.73	2.2921	16 34 33.5	4.401
4	2 39 37.39	2.0857	11 44 28.7	7.637	4	4 24 39.40	2.2968	16 38 54.9	4.313
5	2 41 42.65	2.0896	11 52 5.4	7.587	5	4 26 57.34	2.3013	16 43 11.0	4.223
6	2 43 48.14	2.0935	11 59 39.1	7.536	6	4 29 15.55	2.3058	16 47 21.6	4.132
7	2 45 53.87	2.0975	12 7 9.7	7.484	7	4 31 34.04	2.3104	16 51 26.8	4.040
8	2 47 59.84	2.1015	12 14 37.2	7.432	8	4 33 52.80	2.3149	16 55 26.4	3.948
9	2 50 6.05	2.1055	12 22 1.5	7.378	9	4 36 11.83	2.3195	16 59 20.5	3.855
10	2 52 12.50	2.1095	12 29 22.6	7.324	10	4 38 31.14	2.3241	17 3 9.0	3.761
11	2 54 19.19	2.1135	12 36 40.4	7.269	11	4 40 50.72	2.3286	17 6 51.8	3.666
12	2 56 26.12	2.1176	12 43 54.9	7.214	12	4 43 10.57	2.3331	17 10 28.9	3.571
13	2 58 33.30	2.1218	12 51 6.1	7.157	13	4 45 30.69	2.3376	17 14 0.3	3.474
14	3 0 40.74	2.1260	12 58 13.8	7.100	14	4 47 51.08	2.3421	17 17 25.8	3.377
15	3 2 48.42	2.1301	13 5 18.1	7.042	15	4 50 11.74	2.3465	17 20 45.6	3.280
16	3 4 56.35	2.1343	13 12 18.9	6.984	16	4 52 32.66	2.3508	17 23 59.4	3.181
17	3 7 4.54	2.1386	13 19 16.2	6.925	17	4 54 53.84	2.3553	17 27 7.3	3.082
18	3 9 12.98	2.1428	13 26 9.9	6.864	18	4 57 15.29	2.3598	17 30 9.2	2.981
19	3 11 21.68	2.1472	13 32 59.9	6.803	19	4 59 37.01	2.3641	17 33 5.0	2.880
20	3 13 30.64	2.1515	13 39 46.2	6.740	20	5 1 58.98	2.3683	17 35 54.8	2.778
21	3 15 39.86	2.1558	13 46 28.7	6.678	21	5 4 21.21	2.3727	17 38 38.4	2.676
22	3 17 49.33	2.1601	13 53 7.5	6.614	22	5 6 43.70	2.3769	17 41 15.9	2.572
23	3 19 59.07	2.1645	13 59 42.4	6.549	23	5 9 6.44	2.3811	17 43 47.1	2.468
24	3 22 9.07	2.1689	N. 14 6 13.4	6.483	24	5 11 29.43	2.3853	N. 17 46 12.1	2.364

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 25.					SATURDAY 27.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	5 11 29.43	2.3853	N. 17 46 12.1	2.364	0	7 9 57.75	2.5287	N. 17 27 57.2	3.277
1	5 13 52.68	2.3866	17 48 30.8	2.299	1	7 12 29.51	2.5301	17 24 36.9	3.401
2	5 16 16.18	2.3938	17 50 43.2	2.153	2	7 15 1.36	2.5314	17 21 9.1	3.524
3	5 18 39.93	2.3978	17 52 49.1	2.045	3	7 17 33.28	2.5326	17 17 34.0	3.647
4	5 21 3.92	2.4018	17 54 48.6	1.938	4	7 20 5.27	2.5338	17 13 51.5	3.700
5	5 23 28.15	2.4059	17 56 41.7	1.850	5	7 22 37.34	2.5350	17 10 1.6	3.823
6	5 25 52.63	2.4099	17 58 28.2	1.721	6	7 25 9.47	2.5359	17 6 4.3	4.016
7	5 28 17.34	2.4138	18 0 8.2	1.612	7	7 27 41.65	2.5369	17 1 59.7	4.138
8	5 30 42.29	2.4178	18 1 41.6	1.501	8	7 30 13.90	2.5379	16 57 47.7	4.261
9	5 33 7.47	2.4217	18 3 8.3	1.350	9	7 32 46.20	2.5387	16 53 28.4	4.383
10	5 35 32.89	2.4255	18 4 28.4	1.279	10	7 35 18.54	2.5394	16 49 1.7	4.505
11	5 37 58.53	2.4292	18 5 41.8	1.167	11	7 37 50.93	2.5402	16 44 27.8	4.625
12	5 40 24.39	2.4329	18 6 48.4	1.053	12	7 40 23.36	2.5408	16 39 46.7	4.747
13	5 42 50.48	2.4367	18 7 48.2	0.940	13	7 42 55.82	2.5413	16 34 58.2	4.868
14	5 45 16.79	2.4403	18 8 41.2	0.827	14	7 45 28.32	2.5418	16 30 2.5	4.988
15	5 47 43.32	2.4439	18 9 27.4	0.713	15	7 48 0.84	2.5422	16 24 59.6	5.108
16	5 50 10.06	2.4474	18 10 6.7	0.598	16	7 50 33.38	2.5425	16 19 49.5	5.228
17	5 52 37.01	2.4509	18 10 39.1	0.482	17	7 53 5.94	2.5428	16 14 32.3	5.347
18	5 55 4.17	2.4543	18 11 4.5	0.365	18	7 55 38.51	2.5429	16 9 7.9	5.466
19	5 57 31.53	2.4577	18 11 22.9	0.248	19	7 58 11.09	2.5431	16 3 36.4	5.583
20	5 59 59.10	2.4611	18 11 34.3	0.132	20	8 0 43.68	2.5432	15 57 57.9	5.701
21	6 2 26.86	2.4643	18 11 38.7	+0.014	21	8 3 16.27	2.5431	15 52 12.3	5.818
22	6 4 54.81	2.4675	18 11 36.0	-0.104	22	8 5 48.85	2.5430	15 46 19.7	5.935
23	6 7 22.96	2.4707	N. 18 11 26.2	0.23	23	8 8 21.43	2.5429	N. 15 40 20.1	6.050
FRIDAY 26.					SUNDAY 28.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	6 9 51.30	2.4738	N. 18 11 9.3	0.342	0	8 10 54.00	2.5427	N. 15 34 13.7	6.165
1	6 12 19.82	2.4768	18 10 45.2	0.461	1	8 13 26.55	2.5424	15 28 0.3	6.281
2	6 14 48.52	2.4798	18 10 14.0	0.580	2	8 15 59.09	2.5421	15 21 40.0	6.395
3	6 17 17.40	2.4828	18 9 35.6	0.701	3	8 18 31.60	2.5417	15 15 12.9	6.508
4	6 19 46.45	2.4856	18 8 49.9	0.822	4	8 21 4.09	2.5413	15 8 39.1	6.620
5	6 22 15.67	2.4883	18 7 57.0	0.942	5	8 23 36.55	2.5407	15 1 58.5	6.732
6	6 24 45.05	2.4911	18 6 56.9	1.063	6	8 26 8.97	2.5401	14 55 11.3	6.843
7	6 27 14.60	2.4938	18 5 49.5	1.184	7	8 28 41.36	2.5394	14 48 17.4	6.952
8	6 29 44.31	2.4963	18 4 34.8	1.306	8	8 31 13.70	2.5387	14 41 17.0	7.062
9	6 32 14.16	2.4988	18 3 12.8	1.428	9	8 33 46.00	2.5379	14 34 10.0	7.171
10	6 34 44.17	2.5014	18 1 43.4	1.551	10	8 36 18.25	2.5371	14 26 56.5	7.278
11	6 37 14.33	2.5038	18 0 6.7	1.673	11	8 38 50.45	2.5363	14 19 36.6	7.384
12	6 39 44.62	2.5060	17 58 22.7	1.795	12	8 41 22.60	2.5353	14 12 10.4	7.490
13	6 42 15.05	2.5083	17 56 31.3	1.918	13	8 43 54.69	2.5343	14 4 37.8	7.595
14	6 44 45.62	2.5106	17 54 32.5	2.042	14	8 46 26.71	2.5332	13 56 59.0	7.698
15	6 47 16.32	2.5127	17 52 26.3	2.165	15	8 48 58.67	2.5322	13 49 14.0	7.802
16	6 49 47.14	2.5147	17 50 12.7	2.288	16	8 51 30.57	2.5310	13 41 22.8	7.904
17	6 52 18.09	2.5168	17 47 51.7	2.412	17	8 54 2.39	2.5298	13 33 25.5	8.005
18	6 54 49.15	2.5187	17 45 23.3	2.535	18	8 56 34.14	2.5285	13 25 22.2	8.104
19	6 57 20.33	2.5205	17 42 47.5	2.658	19	8 59 5.81	2.5272	13 17 13.0	8.203
20	6 59 51.61	2.5223	17 40 4.3	2.782	20	9 1 37.40	2.5258	13 8 57.9	8.301
21	7 2 23.00	2.5240	17 37 13.7	2.906	21	9 4 8.91	2.5244	13 0 36.9	8.398
22	7 4 54.49	2.5257	17 34 15.6	3.030	22	9 6 40.33	2.5229	12 52 10.2	8.493
23	7 7 26.07	2.5272	17 31 10.1	3.153	23	9 9 11.66	2.5215	12 43 37.7	8.587
24	7 9 57.75	2.5287	N. 17 27 57.2	3.277	24	9 11 42.91	2.5200	N. 12 34 59.7	8.680



### THE MOON'S RIGHT ASCENSION AND DECLINATION.

PHASES OF THE MOON.				
		d	h	m
○	Full Moon . . . . Feb.	1	4	33.2
☾	Last Quarter . . . . .	7	21	56.2
●	New Moon . . . . .	15	23	4.7
☾	First Quarter . . . . .	23	23	8.7

---

		a	n
☾	Perigee . . . . . Feb.	1	12.1
☾	Apogee . . . . .	15	12.4

GREENWICH MEAN TIME.									
LUNAR DISTANCES.									
Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
1	<i>α</i> Arietis W.	92 49 59	2071	94 41 43	2070	96 33 29	2068	98 25 17	2069
	Aldebaran W.	59 51 18	1957	61 46 1	1955	63 40 47	1952	65 35 37	1952
	Pollux W.	19 41 22	2790	21 16 3	2656	22 53 42	2551	24 33 45	2469
	Spica E.	73 53 49	1969	71 59 25	1967	70 4 58	1965	68 10 29	1965
2	Aldebaran W.	75 9 34	1960	77 4 11	1965	78 58 41	1970	80 53 3	1975
	Pollux W.	33 16 23	2247	35 3 41	2225	36 51 31	2208	38 39 47	2195
	Spica E.	58 38 22	1976	56 44 10	1981	54 50 6	1987	52 56 11	1994
	Antares E.	104 18 13	2023	102 25 14	2025	100 32 19	2030	98 39 31	2035
3	Aldebaran W.	90 22 14	2016	92 15 24	2025	94 8 19	2036	96 0 57	2048
	Pollux W.	47 44 32	2171	49 33 43	2173	51 22 52	2176	53 11 56	2180
	Spica E.	43 29 41	2010	41 37 9	2052	39 44 56	2065	37 53 3	2079
	Antares E.	89 18 0	2074	87 26 21	2084	85 34 57	2096	83 43 51	2107
	VENUS E.	115 59 10	2389	114 15 20	2400	112 31 45	2412	110 48 27	2424
4	Pollux W.	62 14 52	2222	64 2 47	2233	65 50 25	2245	67 37 45	2258
	Regulus W.	25 23 55	2143	27 13 48	2155	29 3 24	2167	30 52 42	2179
	Spica E.	28 39 34	2166	26 50 15	2188	25 1 29	2212	23 13 19	2238
	Antares E.	74 33 10	2177	72 44 8	2192	70 55 29	2209	69 7 15	2226
	VENUS E.	102 16 36	2495	100 35 15	2511	98 54 17	2527	97 13 41	2543
5	Pollux W.	76 29 25	2331	78 14 39	2347	79 59 30	2364	81 43 57	2381
	Regulus W.	39 53 59	2254	41 41 6	2270	43 27 49	2287	45 14 7	2304
	Antares E.	60 12 41	2320	58 27 11	2341	56 42 11	2362	54 57 41	2383
	VENUS E.	88 56 42	2634	87 18 33	2653	85 40 50	2672	84 3 33	2692
	<i>α</i> Aquilæ E.	108 36 15	2712	106 59 51	2720	105 23 38	2730	103 47 38	2741
	SUN E.	126 52 15	2572	125 12 42	2590	123 33 33	2608	121 54 49	2627
6	Pollux W.	90 19 59	2469	92 1 56	2488	93 43 26	2506	95 24 31	2525
	Regulus W.	53 59 22	2391	55 43 9	2409	57 26 31	2427	59 9 27	2446
	Antares E.	46 23 9	2500	44 41 56	2525	43 1 18	2552	41 21 17	2580
	VENUS E.	76 3 41	2792	74 29 2	2811	72 54 49	2832	71 21 2	2852
	<i>α</i> Aquilæ E.	95 51 38	2809	94 17 22	2826	92 43 28	2842	91 9 55	2860
	SUN E.	113 47 31	2722	112 11 20	2741	110 35 34	2760	109 0 14	2780
7	Regulus W.	67 37 49	2533	69 18 16	2551	70 58 18	2568	72 37 57	2585
	Spica W.	14 34 56	2696	16 11 41	2683	17 48 44	2677	19 25 55	2676
	Antares E.	33 11 13	2741	31 35 27	2779	30 0 31	2821	28 26 30	2868
	VENUS E.	63 38 37	2952	62 7 24	2972	60 36 36	2992	59 6 13	3011
	<i>α</i> Aquilæ E.	83 28 6	2957	81 56 59	2978	80 26 19	3000	78 56 6	3022
	SUN E.	101 9 52	2876	99 37 2	2894	98 4 36	2913	96 32 33	2931
8	Regulus W.	80 50 25	2667	82 27 49	2684	84 4 51	2699	85 41 33	2714
	Spica W.	27 30 37	2713	29 7 0	2723	30 43 9	2735	32 19 3	2747

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV <sup>h</sup>	P. L. of Diff.	XVIII <sup>h</sup>	P. L. of Diff.	XXI <sup>h</sup>	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
1	α Arietis	W.	100 17 4	2071	102 8 48	2074	104 0 28	2077	105 52 2	2082
	Aldebaran	W.	67 30 27	1952	69 25 17	1953	71 20 6	1955	73 14 52	1957
	Pollux	W.	26 15 42	2403	27 59 13	2351	29 43 59	2309	31 29 46	2275
	Spica	E.	66 15 59	1965	64 21 30	1967	62 27 3	1969	60 32 40	1972
2	Aldebaran	W.	82 47 16	1982	84 41 19	1989	86 35 10	1997	88 28 49	2006
	Pollux	W.	40 28 22	2185	42 17 12	2178	44 6 13	2173	45 55 21	2171
	Spica	E.	51 2 27	2001	49 8 54	2010	47 15 35	2019	45 22 30	2029
	Antares	E.	96 46 51	2041	94 54 21	2048	93 2 1	2056	91 9 54	2064
3	Aldebaran	W.	97 53 17	2059	99 45 19	2072	101 37 1	2085	103 28 23	2099
	Pollux	W.	55 0 53	2186	56 49 41	2194	58 38 18	2202	60 26 42	2212
	Spica	E.	36 1 32	2094	34 10 24	2110	32 19 40	2128	30 29 23	2146
	Antares	E.	81 53 2	2120	80 2 33	2133	78 12 24	2147	76 22 36	2161
	VENUS	E.	109 5 26	2437	107 22 44	2450	105 40 21	2465	103 58 18	2480
4	Pollux	W.	69 24 47	2272	71 11 28	2285	72 57 49	2300	74 43 48	2315
	Regulus	W.	32 41 41	2193	34 30 19	2208	36 18 35	2223	38 6 28	2238
	Spica	E.	21 25 48	2268	19 39 2	2304	17 53 8	2345	16 8 14	2394
	Antares	E.	67 19 26	2244	65 32 4	2262	63 45 8	2281	61 58 40	2300
	VENUS	E.	95 33 28	2561	93 53 40	2579	92 14 16	2596	90 35 16	2615
5	Pollux	W.	83 27 59	2398	85 11 37	2415	86 54 50	2434	88 37 37	2451
	Regulus	W.	47 0 1	2322	48 45 29	2339	50 30 32	2356	52 15 10	2374
	Antares	E.	53 13 42	2405	51 30 14	2428	49 47 19	2451	48 4 57	2475
	VENUS	E.	82 26 42	2711	80 50 17	2731	79 14 18	2751	77 38 46	2772
	α Aquilæ	E.	102 11 52	2753	100 36 22	2766	99 1 9	2779	97 26 14	2794
	SUN	E.	120 16 31	2645	118 38 37	2664	117 1 9	2684	115 24 7	2703
6	Pollux	W.	97 5 9	2543	98 45 22	2562	100 25 9	2582	102 4 29	2600
	Regulus	W.	60 51 57	2463	62 34 2	2481	64 15 42	2498	65 56 58	2516
	Antares	E.	39 41 54	2609	38 3 11	2638	36 25 8	2670	34 47 48	2704
	VENUS	E.	69 47 42	2872	68 14 47	2892	66 42 18	2913	65 10 15	2932
	α Aquilæ	E.	89 36 45	2878	88 3 58	2898	86 31 36	2916	84 59 38	2937
	SUN	E.	107 25 20	2799	105 50 51	2818	104 16 46	2838	102 43 7	2856
7	Regulus	W.	74 17 12	2602	75 56 4	2619	77 34 33	2635	79 12 40	2652
	Spica	W.	21 3 7	2680	22 40 14	2686	24 17 13	2694	25 54 1	2703
	Antares	E.	26 53 30	2920	25 21 36	2978	23 50 56	3045	22 21 39	3124
	VENUS	E.	57 36 14	3031	56 6 39	3049	54 37 27	3069	53 8 39	3087
	α Aquilæ	E.	77 26 21	3045	75 57 4	3069	74 28 16	3092	72 59 56	3117
	SUN	E.	95 0 54	2950	93 29 38	2958	91 58 45	2985	90 28 14	3003
8	Regulus	W.	87 17 55	2740	88 53 57	2744	90 29 39	2758	92 5 2	2772
	Spica	W.	33 54 41	2759	35 30 3	2770	37 5 10	2782	38 40 1	2794

GREENWICH MEAN TIME.										
LUNAR DISTANCES.										
Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
8	VENUS	E.	51 40 14	3105	50 12 11	3124	48 44 31	3142	47 17 12	3160
	$\alpha$ Aquilæ	E.	71 32 7	3142	70 4 48	3168	68 38 0	3194	67 11 43	3221
	SUN	E.	88 58 5	3020	87 28 17	3038	85 58 51	3054	84 29 45	3070
9	Regulus	W.	93 40 7	2785	95 14 54	2798	96 49 24	2811	98 23 37	2825
	Spica	W.	40 14 37	2806	41 48 57	2818	43 23 2	2829	44 56 52	2841
	VENUS	E.	40 5 53	3246	38 40 38	3262	37 15 42	3279	35 51 6	3295
	$\alpha$ Aquilæ	E.	60 8 42	3372	58 45 53	3405	57 23 42	3439	56 2 10	3477
	SUN	E.	77 9 9	3148	75 41 58	3163	74 15 4	3177	72 48 27	3190
10	Spica	W.	52 42 27	2894	54 14 53	2904	55 47 7	2914	57 19 8	2923
	VENUS	E.	28 52 48	3377	27 30 5	3394	26 7 41	3410	24 45 36	3429
	SUN	E.	65 39 18	3254	64 14 13	3265	62 49 21	3277	61 24 42	3288
11	Spica	W.	64 56 24	2966	66 27 20	2974	67 58 6	2981	69 28 43	2988
	Antares	W.	21 3 22	3426	22 25 9	3376	23 47 53	3337	25 11 22	3305
	SUN	E.	54 24 32	3337	53 1 3	3346	51 37 45	3354	50 14 36	3363
12	Spica	W.	76 59 43	3019	78 29 32	3024	79 59 15	3029	81 28 52	3034
	Antares	W.	32 16 8	3213	33 42 2	3203	35 8 7	3194	36 34 23	3188
	SUN	E.	43 21 8	3400	41 58 51	3406	40 36 41	3413	39 14 39	3418
13	Spica	W.	88 55 31	3055	90 24 36	3058	91 53 37	3061	93 22 34	3065
	Antares	W.	43 47 25	3165	45 14 16	3163	46 41 10	3161	48 8 6	3158
	SUN	E.	32 26 4	3446	31 4 39	3451	29 43 20	3456	28 22 7	3462
18	SUN	W.	22 4 7	3451	23 25 26	3444	24 46 53	3436	26 8 29	3430
	$\alpha$ Arietis	E.	46 30 5	3268	45 6 6	3277	43 41 28	3287	42 17 1	3299
	Aldebaran	E.	78 4 59	3036	76 35 31	3032	75 5 58	3029	73 36 21	3024
19	SUN	W.	32 58 22	3395	34 20 44	3388	35 43 14	3381	37 5 52	3374
	$\alpha$ Arietis	E.	35 18 45	3384	33 56 10	3410	32 34 5	3440	31 12 34	3476
	Aldebaran	E.	66 6 52	3001	64 36 40	2996	63 6 22	2990	61 35 57	2984
20	SUN	W.	44 1 10	3355	45 24 41	3326	46 48 22	3310	48 12 13	3308
	MARS	W.	19 35 2	3242	21 0 22	3233	22 25 52	3225	23 51 32	3215
	JUPITER	W.	16 40 50	3043	18 10 10	3034	19 39 41	3025	21 9 23	3016
	Aldebaran	E.	54 1 55	2951	52 30 41	2944	50 59 18	2936	49 27 45	2929
	Pollux	E.	97 34 46	3040	96 5 23	3032	94 35 50	3024	93 6 7	3016
21	SUN	W.	55 14 13	3259	56 39 13	3248	58 4 25	3237	59 29 50	3226
	MARS	W.	31 2 41	3167	32 29 30	3157	33 56 31	3145	35 23 46	3134
	JUPITER	W.	28 40 41	2970	30 11 32	2959	31 42 36	2949	33 13 53	2938
	Aldebaran	E.	41 47 25	2885	40 14 47	2876	38 41 57	2866	37 8 54	2856
	Pollux	E.	85 34 56	2973	84 4 9	2964	82 33 11	2954	81 2 1	2945
22	SUN	W.	66 40 24	3164	68 7 16	3151	69 34 24	3137	71 1 49	3124
	MARS	W.	42 43 29	3074	44 12 11	3061	45 41 8	3048	47 10 22	3035
	JUPITER	W.	40 53 48	2880	42 26 32	2869	43 59 31	2856	45 32 47	2843

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
8	VENUS	E.	45 50 15	3177	44 23 38	3195	42 57 23	3212	41 31 28	3229
	α Aquilæ	E.	65 45 59	3249	64 20 48	3278	62 56 11	3308	61 32 9	3339
	SUN	E.	83 0 59	3087	81 32 33	3103	80 4 27	3118	78 36 39	3133
9	Regulus	W.	99 57 33	2837	101 31 13	2849	103 4 38	2861	104 37 47	2872
	Spica	W.	46 30 27	2852	48 3 48	2863	49 36 54	2873	51 9 47	2884
	VENUS	E.	34 26 49	3311	33 2 50	3328	31 39 11	3344	30 15 50	3360
	α Aquilæ	E.	54 41 20	3516	53 21 13	3555	52 1 50	3598	50 43 13	3644
	SUN	E.	71 22 6	3204	69 56 1	3217	68 30 12	3230	67 4 38	3242
10	Spica	W.	58 50 58	2932	60 22 36	2942	61 54 2	2950	63 25 18	2958
	VENUS	E.	23 23 52	3447	22 2 29	3467	20 41 28	3489	19 20 52	3513
	SUN	E.	60 0 16	3299	58 36 3	3308	57 12 1	3319	55 48 11	3328
11	Spica	W.	70 59 11	2994	72 29 31	3001	73 59 42	3007	75 29 46	3013
	Antares	W.	26 35 28	3278	28 0 5	3258	29 25 6	3240	30 50 28	3225
	SUN	E.	48 51 37	3371	47 28 47	3379	46 6 6	3386	44 43 33	3393
12	Spica	W.	82 58 23	3039	84 27 48	3043	85 57 8	3048	87 26 22	3052
	Antares	W.	38 0 47	3181	39 27 19	3177	40 53 56	3173	42 20 38	3168
	SUN	E.	37 52 43	3424	36 30 54	3430	35 9 11	3435	33 47 34	3441
13	Spica	W.	94 51 27	3067	96 20 17	3070	97 49 3	3072	99 17 47	3074
	Antares	W.	49 35 5	3156	51 2 7	3155	52 29 10	3153	53 56 15	3153
	SUN	E.	27 1 0	3467	25 39 59	3472	24 19 3	3477	22 58 13	3483
18	SUN	W.	27 30 12	3423	28 52 3	3416	30 14 2	3409	31 36 8	3402
	α Arietis	E.	40 52 48	3311	39 28 49	3326	38 5 7	3343	36 41 45	3362
	Aldebaran	E.	72 6 38	3020	70 36 50	3016	69 6 57	3011	67 36 58	3006
19	SUN	W.	38 28 38	3366	39 51 33	3359	41 14 36	3352	42 37 48	3343
	α Arietis	E.	29 51 43	3516	28 31 37	3566	27 12 25	3624	25 54 17	3694
	Aldebaran	E.	60 5 24	2978	58 34 44	2972	57 3 56	2966	55 33 0	2958
20	SUN	W.	49 36 15	3299	51 0 28	3290	52 24 51	3280	53 49 26	3270
	MARS	W.	25 17 23	3205	26 43 26	3197	28 9 39	3187	29 36 4	3177
	JUPITER	W.	22 39 16	3007	24 9 20	2998	25 39 35	2993	27 10 2	2979
	Aldebaran	E.	47 56 3	2920	46 24 10	2912	44 52 6	2903	43 19 51	2894
	Pollux	E.	91 36 14	3008	90 6 11	2999	88 35 57	2990	87 5 32	2981
21	SUN	W.	60 55 28	3215	62 21 20	3202	63 47 27	3190	65 13 48	3178
	MARS	W.	36 51 14	3123	38 18 56	3111	39 46 52	3099	41 15 3	3087
	JUPITER	W.	34 45 24	2928	36 17 8	2916	37 49 7	2905	39 21 20	2893
	Aldebaran	E.	35 35 38	2845	34 2 8	2834	32 28 24	2822	30 54 25	2811
	Pollux	E.	79 30 39	2935	77 59 5	2926	76 27 19	2916	74 55 20	2905
22	SUN	W.	72 29 30	3109	73 57 29	3095	75 25 45	3080	76 54 19	3065
	MARS	W.	48 39 52	3020	50 9 40	3006	51 39 45	2992	53 10 8	2977
	JUPITER	W.	47 6 19	2829	48 40 9	2816	50 14 16	2802	51 48 42	2788

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
22	Aldebaran	E.	29 20 12	2800	27 45 44	2788	26 11 0	2776	24 36 0	2763
	Pollux	E.	73 23 8	2895	71 50 43	2885	70 18 5	2875	68 45 14	2864
23	SUN	W.	78 23 12	3049	79 52 24	3034	81 21 55	3017	82 51 47	3002
	MARS	W.	54 40 50	2962	56 11 51	2946	57 43 11	2931	59 14 51	2915
	JUPITER	W.	53 23 26	2774	54 58 28	2759	56 33 50	2744	58 9 31	2729
	α Arietis	W.	20 59 55	3750	22 15 49	3599	23 34 24	3472	24 55 19	3364
	Pollux	E.	60 57 34	2811	59 23 21	2801	57 48 54	2791	56 14 14	2781
	Regulus	E.	96 41 52	2700	95 5 12	2686	93 28 13	2672	91 50 55	2657
24	SUN	W.	90 26 13	2916	91 58 11	2899	93 30 31	2880	95 3 15	2863
	MARS	W.	66 58 21	2832	68 32 8	2815	70 6 17	2797	71 40 49	2779
	JUPITER	W.	66 13 8	2649	67 50 56	2632	69 29 7	2616	71 7 40	2599
	α Arietis	W.	32 6 18	2997	33 36 35	2946	35 7 56	2898	36 40 17	2854
	Pollux	E.	48 17 45	2737	46 41 54	2729	45 5 53	2723	43 29 44	2719
	Regulus	E.	83 39 14	2579	81 59 50	2562	80 20 3	2546	78 39 53	2530
25	SUN	W.	102 52 43	2771	104 27 49	2753	106 3 19	2734	107 39 14	2715
	MARS	W.	79 39 20	2689	81 16 15	2671	82 53 34	2652	84 31 18	2635
	JUPITER	W.	79 26 15	2513	81 7 10	2495	82 48 30	2478	84 30 14	2461
	α Arietis	W.	44 35 1	2675	46 12 15	2644	47 50 10	2615	49 28 44	2588
	Pollux	E.	35 28 5	2722	33 51 54	2731	32 15 55	2744	30 40 14	2764
	Regulus	E.	70 13 18	2446	68 30 48	2428	66 47 53	2411	65 4 34	2394
26	SUN	W.	115 45 2	2623	117 23 26	2604	119 2 15	2586	120 41 29	2569
	JUPITER	W.	93 5 6	2373	94 49 19	2356	96 33 57	2340	98 18 59	2322
	MARS	W.	92 46 9	2543	94 26 22	2525	96 7 0	2508	97 48 2	2490
	α Arietis	W.	57 50 43	2462	59 32 50	2440	61 15 28	2417	62 58 38	2396
	Aldebaran	W.	23 47 45	2302	25 33 42	2285	27 20 3	2268	29 6 50	2252
	Regulus	E.	56 21 53	2310	54 36 8	2294	52 49 59	2277	51 3 25	2261
	Spica	E.	109 51 26	2314	108 5 47	2298	106 19 44	2280	104 33 15	2264
27	α Arietis	W.	71 41 44	2300	73 27 44	2283	75 14 9	2266	77 0 59	2250
	Aldebaran	W.	38 6 47	2172	39 55 57	2157	41 45 30	2142	43 35 25	2128
	Regulus	E.	42 4 50	2185	40 16 0	2172	38 26 50	2158	36 37 19	2145
	Spica	E.	95 34 46	2184	93 45 54	2169	91 56 39	2154	90 7 2	2140
28	α Arietis	W.	86 0 41	2181	87 49 37	2170	89 38 50	2159	91 28 20	2149
	Aldebaran	W.	52 50 9	2064	54 42 4	2053	56 34 16	2043	58 26 44	2032
	Regulus	E.	27 25 20	2094	25 34 12	2088	23 42 54	2083	21 51 28	2080
	Spica	E.	80 53 48	2076	79 2 12	2065	77 10 19	2055	75 18 10	2045
29	Aldebaran	W.	67 52 39	1993	69 46 25	1986	71 40 21	1981	73 34 25	1977
	Pollux	W.	26 36 16	2439	28 18 55	2382	30 2 56	2334	31 48 6	2293
	Spica	E.	65 54 0	2007	64 0 36	2002	62 7 4	1997	60 13 25	1993

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
22	Aldebaran	E.	23 0 43	2750	21 25 10	2737	19 49 19	2721	18 13 11	2711
	Pollux	E.	67 12 9	2854	65 38 51	2843	64 5 19	2832	62 31 33	2822
23	SUN	W.	84 21 58	2985	85 52 30	2969	87 23 22	2950	88 54 37	2934
	MARS	W.	60 46 51	2898	62 19 12	2882	63 51 54	2866	65 24 56	2849
	JUPITER	W.	59 45 33	2714	61 21 55	2698	62 58 38	2682	64 35 42	2666
	α Arietis	W.	26 18 17	3271	27 43 3	3189	29 9 25	3118	30 37 13	3055
	Pollux	E.	54 39 21	2771	53 4 15	2762	51 28 57	2752	49 53 26	2744
	Regulus	E.	90 13 17	2641	88 35 18	2626	86 56 58	2610	85 18 17	2594
24	SUN	W.	96 36 21	2845	98 9 51	2827	99 43 44	2808	101 18 2	2790
	MARS	W.	73 15 44	2762	74 51 2	2744	76 26 44	2726	78 2 50	2708
	JUPITER	W.	72 46 36	2583	74 25 55	2565	76 5 38	2548	77 45 44	2530
	α Arietis	W.	38 13 35	2814	39 47 45	2776	41 22 44	2741	42 58 30	2707
	Pollux	E.	41 53 29	2715	40 17 9	2713	38 40 46	2714	37 4 24	2716
	Regulus	E.	76 59 21	2513	75 18 26	2496	73 37 7	2479	71 55 24	2463
25	SUN	W.	109 15 34	2696	110 52 19	2678	112 29 28	2659	114 7 3	2641
	MARS	W.	86 9 26	2616	87 47 59	2598	89 26 57	2579	91 6 21	2561
	JUPITER	W.	86 12 22	2443	87 54 56	2426	89 37 54	2408	91 21 18	2391
	α Arietis	W.	51 7 56	2561	52 47 45	2535	54 28 10	2510	56 9 10	2486
	Pollux	E.	29 4 59	2790	27 30 18	2825	25 56 22	2872	24 23 27	2932
	Regulus	E.	63 20 51	2377	61 36 43	2360	59 52 11	2343	58 7 14	2326
26	SUN	W.	122 21 7	2551	124 1 9	2534	125 41 35	2517	127 22 25	2500
	JUPITER	W.	100 4 26	2306	101 50 17	2289	103 36 32	2274	105 23 10	2258
	MARS	W.	99 29 29	2473	101 11 20	2455	102 53 36	2439	104 36 15	2422
	α Arietis	W.	64 42 18	2376	66 26 27	2356	68 11 5	2340	69 56 11	2318
	Aldebaran	W.	30 54 1	2235	32 41 37	2219	34 29 37	2203	36 18 0	2187
	Regulus	E.	49 16 28	2245	47 29 8	2229	45 41 24	2215	43 53 18	2200
	Spica	E.	102 46 22	2247	100 59 4	2231	99 11 22	2215	97 23 16	2198
27	α Arietis	W.	78 48 12	2235	80 35 48	2221	82 23 45	2206	84 12 3	2193
	Aldebaran	W.	45 25 41	2115	47 16 18	2101	49 7 16	2088	50 58 33	2076
	Regulus	E.	34 47 29	2134	32 57 21	2122	31 6 56	2112	29 16 15	2103
	Spica	E.	88 17 3	2126	86 26 44	2113	84 36 4	2100	82 45 5	2088
28	α Arietis	W.	93 18 4	2140	95 8 2	2132	96 58 12	2125	98 48 33	2119
	Aldebaran	W.	60 19 28	2023	62 12 26	2014	64 5 38	2006	65 59 3	1999
	Regulus	E.	19 59 58	2080	18 8 28	2084	16 17 4	2094	14 25 55	2112
	Spica	E.	73 25 46	2036	71 33 8	2028	69 40 17	2020	67 47 14	2013
29	Aldebaran	W.	75 28 36	1973	77 22 53	1970	79 17 14	1968	81 11 39	1967
	Pollux	W.	33 34 16	2260	35 21 15	2231	37 8 57	2207	38 57 14	2186
	Spica	E.	58 19 39	1990	56 25 49	1988	54 31 55	1976	52 37 59	1986

## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ' "	"	' "	s	m s	s
Tues.	1	22 48 2.28	9.363	S. 7 37 50.4	+ 56.92	16 10.07	65.42	12 33.65	0.492
Wed.	2	22 51 46.73	9.342	7 15 1.1	57.18	16 9.83	65.34	12 21.57	0.514
Thur.	3	22 55 30.68	9.321	6 52 5.6	57.43	16 9.58	65.27	12 9.00	0.533
Frid.	4	22 59 14.16	9.302	6 29 4.3	+ 57.67	16 9.33	65.20	11 55.97	0.552
Sat.	5	23 2 57.20	9.284	6 5 57.5	57.89	16 9.08	65.14	11 42.50	0.570
SUN.	6	23 6 39.81	9.267	5 42 45.7	58.09	16 8.82	65.08	11 28.60	0.587
Mon.	7	23 10 22.02	9.251	5 19 29.2	+ 58.28	16 8.56	65.02	11 14.30	0.604
Tues.	8	23 14 3.86	9.236	4 56 8.4	58.45	16 8.30	64.96	10 59.62	0.619
Wed.	9	23 17 45.33	9.221	4 32 43.6	58.61	16 8.03	64.91	10 44.58	0.634
Thur.	10	23 21 26.46	9.207	4 9 15.3	+ 58.75	16 7.77	64.85	10 29.20	0.648
Frid.	11	23 25 7.27	9.194	3 45 43.8	58.87	16 7.50	64.80	10 13.50	0.660
Sat	12	23 28 47.77	9.182	3 22 9.6	58.97	16 7.23	64.75	9 57.50	0.673
SUN.	13	23 32 27.99	9.170	2 58 33.0	+ 59.06	16 6.96	64.71	9 41.21	0.684
Mon.	14	23 36 7.94	9.159	2 34 54.3	59.14	16 6.70	64.67	9 24.65	0.695
Tues.	15	23 39 47.64	9.149	2 11 14.1	59.20	16 6.43	64.63	9 7.84	0.705
Wed.	16	23 43 27.11	9.140	1 47 32.6	+ 59.25	16 6.15	64.60	8 50.80	0.714
Thur.	17	23 47 6.37	9.131	1 23 50.3	59.27	16 5.88	64.57	8 33.56	0.723
Frid.	18	23 50 45.42	9.123	1 0 7.5	59.28	16 5.61	64.54	8 16.11	0.731
Sat.	19	23 54 24.30	9.116	0 36 24.6	+ 59.28	16 5.34	64.52	7 58.48	0.738
SUN.	20	23 58 3.01	9.110	S. 0 12 42.0	59.26	16 5.07	64.50	7 40.69	0.744
Mon.	21	0 1 41.58	9.104	N. 0 11 0.0	59.23	16 4.81	64.48	7 22.76	0.750
Tues.	22	0 5 20.01	9.099	0 34 40.9	+ 59.18	16 4.53	64.46	7 4.69	0.755
Wed.	23	0 8 58.34	9.095	0 58 20.4	59.11	16 4.26	64.45	6 46.52	0.760
Thur.	24	0 12 36.57	9.092	1 21 58.2	59.03	16 4.00	64.44	6 28.25	0.763
Frid.	25	0 16 14.74	9.089	1 45 33.8	+ 58.93	16 3.73	64.44	6 9.91	0.765
Sat.	26	0 19 52.84	9.087	2 9 6.8	58.82	16 3.45	64.43	5 51.51	0.767
SUN.	27	0 23 30.91	9.086	2 32 37.1	58.69	16 3.18	64.43	5 33.09	0.768
Mon.	28	0 27 8.98	9.086	2 56 4.1	+ 58.55	16 2.91	64.43	5 14.65	0.768
Tues	29	0 30 47.06	9.087	3 19 27.6	58.40	16 2.64	64.44	4 56.23	0.767
Wed.	30	0 34 25.18	9.089	3 42 47.3	58.23	16 2.37	64.45	4 37.84	0.765
Thur.	31	0 38 3.35	9.092	4 6 2.8	58.05	16 2.09	64.46	4 19.52	0.762
Frid.	32	0 41 41.62	9.097	N. 4 29 13.7	+ 57.85	16 1.81	64.47	4 1.28	0.758

NOTE.—The mean time of semidiameter passing the meridian may be found by subtracting 0<sup>s</sup> 18 from the sidereal time. The sign + prehexd to the hourly change of declination indicates that south declinations are decreasing; north declinations, increasing.

NOTE.—The mean time of semidiameter passing the meridian may be found by subtracting 0° 18 from the sidereal time. The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing; north declinations, increasing.



## AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ' "	"	m s	s	h m s
Tues.	1	22 48 0.32	9.364	S. 7 38 2.3	+ 56.33	12 33.75	0.493	22 35 26.57
Wed.	2	22 51 44.80	9.343	7 15 12.9	57.19	12 21.68	0.513	22 39 23.12
Thur.	3	22 55 28.79	9.323	6 52 17.2	57.44	12 9.11	0.533	22 43 19.68
Frid.	4	22 59 12.31	9.304	6 29 15.7	+ 57.68	11 56.08	0.552	22 47 16.23
Sat.	5	23 2 55.38	9.286	6 6 8.8	57.90	11 42.61	0.570	22 51 12.78
SUN.	6	23 6 38.04	9.269	5 42 56.8	58.10	11 28.71	0.588	22 55 9.33
Mon.	7	23 10 20.29	9.253	5 19 40.1	+ 58.29	11 14.41	0.604	22 59 5.88
Tues.	8	23 14 2.16	9.237	4 56 19.1	58.46	10 59.73	0.619	23 3 2.43
Wed.	9	23 17 43.68	9.223	4 32 54.1	58.62	10 44.69	0.634	23 6 58.99
Thur.	10	23 21 24.85	9.209	4 9 25.6	+ 58.76	10 29.31	0.647	23 10 55.54
Frid.	11	23 25 5.70	9.196	3 45 53.9	58.88	10 13.61	0.660	23 14 52.09
Sat.	12	23 28 46.25	9.183	3 22 19.4	58.99	9 57.61	0.673	23 18 48.64
SUN.	13	23 32 26.51	9.172	2 58 42.5	+ 59.08	9 41.32	0.685	23 22 45.19
Mon.	14	23 36 6.50	9.161	2 35 3.6	59.16	9 24.76	0.695	23 26 41.75
Tues.	15	23 39 46.25	9.151	2 11 23.1	59.22	9 7.95	0.705	23 30 38.30
Wed.	16	23 43 25.76	9.142	1 47 41.4	+ 59.26	8 50.91	0.715	23 34 34.85
Thur.	17	23 47 5.06	9.133	1 23 58.7	59.29	8 32.66	0.723	23 38 31.40
Frid.	18	23 50 44.16	9.125	1 0 15.7	59.30	8 16.21	0.731	23 42 27.95
Sat.	19	23 54 23.09	9.118	0 36 32.5	+ 59.29	7 58.58	0.738	23 46 24.51
SUN.	20	23 58 1.84	9.112	S. 0 12 49.6	59.27	7 40.79	0.745	23 50 21.06
Mon.	21	0 1 40.46	9.106	N. 0 10 52.7	59.24	7 22.85	0.750	23 54 17.61
Tues.	22	0 5 18.94	9.101	0 34 34.0	+ 59.19	7 4.78	0.755	23 58 14.16
Wed.	23	0 8 57.31	9.097	0 58 13.8	59.13	6 46.60	0.760	0 2 10.71
Thur.	24	0 12 35.59	9.093	1 21 51.8	59.04	6 28.33	0.763	0 6 7.26
Frid.	25	0 16 13.80	9.091	1 45 27.7	+ 58.94	6 9.99	0.765	0 10 3.81
Sat.	26	0 19 51.96	9.089	2 9 1.1	58.83	5 51.59	0.767	0 14 0.37
SUN.	27	0 23 30.08	9.088	2 32 31.6	58.71	5 33.16	0.768	0 17 56.92
Mon.	28	0 27 8.19	9.088	2 55 59.0	+ 58.57	5 14.72	0.768	0 21 53.47
Tues.	29	0 30 46.31	9.089	3 19 22.8	58.41	4 56.29	0.767	0 25 50.02
Wed.	30	0 34 24.48	9.091	3 42 42.8	58.24	4 37.90	0.765	0 29 46.57
Thur.	31	0 38 2.70	9.094	4 5 58.6	58.06	4 19.57	0.762	0 33 43.13
Frid.	32	0 41 41.00	9.098	N. 4 29 9.8	+ 57.87	4 1.33	0.758	0 37 39.68

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.  
The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing, north declinations increasing.

Diff. for 1 Hour.  
+9'.8565.  
(Table III.)

AT GREENWICH MEAN NOON.									
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.	
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.				
		$\lambda$	$\lambda'$						
		$^{\circ}$ $'$ $''$	$^{\circ}$ $'$ $''$	$''$	$''$			$^{\text{h}}$ $^{\text{m}}$ $^{\text{s}}$	
1	61	340 30 16.3	30 7.5	150.40	— 0.48	9.996 1459	+ 45.0	I 24 19.58	
2	62	341 30 25.0	30 16.2	150.33	0.34	9.996 2548	45.7	I 20 23.67	
3	63	342 30 32.0	30 23.1	150.25	0.20	9.996 3654	46.4	I 16 27.76	
4	64	343 30 37.2	30 28.2	150.18	— 0.07	9.996 4777	+ 47.1	I 12 31.86	
5	65	344 30 40.7	30 31.6	150.11	+ 0.07	9.996 5916	47.7	I 8 35.95	
6	66	345 30 42.6	30 33.5	150.05	0.18	9.996 7068	48.3	I 4 40.05	
7	67	346 30 42.9	30 33.7	149.98	+ 0.25	9.996 8234	+ 48.8	I 0 44.14	
8	68	347 30 41.6	30 32.2	149.91	0.30	9.996 9410	49.2	0 56 48.23	
9	69	348 30 38.6	30 29.2	149.84	0.33	9.997 0596	49.6	0 52 52.33	
10	70	349 30 34.0	30 24.5	149.77	+ 0.34	9.997 1789	+ 49.9	0 48 56.42	
11	71	350 30 27.7	30 18.2	149.70	0.31	9.997 2988	50.1	0 45 0.51	
12	72	351 30 19.7	30 10.1	149.63	0.26	9.997 4192	50.3	0 41 4.61	
13	73	352 30 10.0	30 0.2	149.56	+ 0.17	9.997 5400	+ 50.4	0 37 8.70	
14	74	353 29 58.4	29 48.6	149.48	+ 0.07	9.997 6611	50.5	0 33 12.80	
15	75	354 29 45.0	29 35.1	149.40	— 0.04	9.997 7824	50.6	0 29 16.89	
16	76	355 29 29.7	29 19.8	149.32	— 0.17	9.997 9037	+ 50.6	0 25 20.99	
17	77	356 29 12.5	29 2.4	149.24	0.31	9.998 0251	50.6	0 21 25.08	
18	78	357 28 53.2	28 43.1	149.15	0.45	9.998 1465	50.6	0 17 29.17	
19	79	358 28 31.8	28 21.7	149.07	— 0.58	9.998 2678	+ 50.5	0 13 33.27	
20	80	359 28 8.3	27 58.1	148.98	0.69	9.998 3891	50.5	0 9 37.36	
21	81	0 27 42.6	27 32.3	148.88	0.79	9.998 5103	50.5	0 5 41.46	
22	82	1 27 14.7	27 4.3	148.79	— 0.86	9.998 6316	+ 50.5	{ 0 1 45.55 }	
23	83	2 26 44.5	26 34.0	148.69	0.89	9.998 7528	50.5	23 57 49.64	
24	84	3 26 12.0	26 1.4	148.60	0.90	9.998 8741	50.6	23 53 53.73	
25	85	4 25 37.1	25 26.4	148.50	— 0.88	9.998 9957	+ 50.7	23 49 57.83	
26	86	5 24 59.9	24 49.1	148.40	0.83	9.999 1176	50.9	23 46 1.92	
27	87	6 24 20.3	24 9.5	148.30	0.74	9.999 2399	51.1	23 42 6.02	
28	88	7 23 38.4	23 27.5	148.21	— 0.63	9.999 3628	+ 51.3	23 38 10.11	
29	89	8 22 54.2	22 43.2	148.11	0.51	9.999 4862	51.6	23 34 14.21	
30	90	9 22 7.8	21 56.8	148.02	0.37	9.999 6104	51.9	23 30 18.30	
31	91	10 21 19.3	21 8.2	147.94	0.23	9.999 7353	52.2	23 26 22.40	
32	92	11 20 28.7	20 17.5	147.85	— 0.09	9.999 8609	+ 52.5	23 22 26.49	
								23 18 30.58	
NOTE.—The longitudes in the column $\lambda$ are referred to the true equinox of their own date, while those in the column $\lambda'$ are referred to the mean equinox of the beginning of the Besselian fictitious year.									Diff. for 1 Hour, — 9 <sup>h</sup> .8296. (Table II.)

## GREENWICH MEAN TIME.

## THE MOON'S

Day of the Month.									
	SEMI- DIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	' "	' "	' "	"	' "	"	h m	m	d
1	16 44.7	16 44.2	61 21.6	+ 0.03	61 19.4	- 0.39	12 3.9	2.37	14.0
2	16 42.1	16 38.9	61 12.2	- 0.80	61 0.2	1.18	13 0.1	2.31	15.0
3	16 34.4	16 28.9	60 43.7	1.53	60 23.4	1.83	13 54.9	2.26	16.0
4	16 22.4	16 15.3	59 59.8	- 2.07	59 33.7	- 2.25	14 48.5	2.22	17.0
5	16 7.7	15 59.8	59 5.8	2.37	58 36.7	2.43	15 41.4	2.19	18.0
6	15 51.8	15 43.9	58 7.3	2.44	57 38.2	2.40	16 33.4	2.16	19.0
7	15 36.1	15 28.7	57 9.7	- 2.32	56 42.5	- 2.20	17 24.8	2.12	20.0
8	15 21.7	15 15.3	56 16.9	2.05	55 53.1	1.89	18 15.4	2.09	21.0
9	15 9.4	15 4.1	55 31.5	1.71	55 12.1	1.52	19 5.0	2.04	22.0
10	14 59.4	14 55.4	54 55.0	- 1.32	54 40.2	- 1.13	19 53.3	1.98	23.0
11	14 52.0	14 49.3	54 27.8	0.93	54 17.8	0.75	20 40.2	1.93	24.0
12	14 47.2	14 45.6	54 9.9	0.56	54 4.2	0.39	21 25.9	1.88	25.0
13	14 44.6	14 44.1	54 0.5	- 0.23	53 58.7	- 0.07	22 10.4	1.83	26.0
14	14 44.1	14 44.6	53 58.7	+ 0.07	54 0.4	+ 0.20	22 53.9	1.80	27.0
15	14 45.4	14 46.6	54 3.5	0.32	54 8.0	0.43	23 37.0	1.79	28.0
16	14 48.2	14 50.1	54 13.8	+ 0.53	54 20.8	+ 0.63	6		29.0
17	14 52.3	14 54.8	54 28.9	0.72	54 38.1	0.80	0 20.1	1.80	0.3
18	14 57.6	15 0.6	54 48.2	0.88	54 59.3	0.96	1 3.7	1.83	1.3
19	15 3.9	15 7.4	55 11.3	+ 1.04	55 24.3	+ 1.12	1 48.2	1.89	2.3
20	15 11.2	15 15.3	55 38.3	1.20	55 53.2	1.28	2 34.3	1.96	3.3
21	15 19.6	15 24.2	56 9.1	1.37	56 26.0	1.45	3 22.4	2.05	4.3
22	15 29.1	15 34.2	56 43.9	+ 1.53	57 2.7	+ 1.60	4 12.8	2.15	5.3
23	15 39.6	15 45.1	57 22.3	1.66	57 42.6	1.72	5 5.5	2.24	6.3
24	15 50.8	15 56.5	58 3.5	1.75	58 24.7	1.76	6 0.3	2.31	7.3
25	16 2.3	16 8.0	58 45.9	+ 1.75	59 6.8	+ 1.70	6 56.5	2.36	8.3
26	16 13.5	16 18.6	59 26.9	1.63	59 45.8	1.50	7 53.5	2.37	9.3
27	16 23.3	16 27.3	60 2.9	1.33	60 17.8	1.13	8 50.4	2.36	10.3
28	16 30.7	16 33.1	60 30.0	+ 0.88	60 38.9	+ 0.59	9 46.8	2.33	11.3
29	16 34.5	16 34.9	60 44.1	+ 0.26	60 45.4	- 0.07	10 42.5	2.30	12.3
30	16 34.0	16 32.1	60 42.4	- 0.42	60 35.3	0.76	11 37.5	2.28	13.3
31	16 29.1	16 25.0	60 24.2	1.09	60 9.1	1.39	12 32.1	2.26	14.3
32	16 20.0	16 14.1	59 50.7	- 1.66	59 29.3	- 1.88	13 26.0	2.25	15.3

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 1.					THURSDAY 3.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	10 11 39.97	2.4733	N. 8 42 53.2	10.532	0	12 7 45.38	2.3659	S. 0 23 37.0	11.648
1	10 14 8.30	2.4711	8 32 19.5	10.591	1	12 10 7.28	2.3639	0 35 15.5	11.634
2	10 16 36.50	2.4688	8 21 42.3	10.648	2	12 12 29.05	2.3619	0 46 53.1	11.619
3	10 19 4.56	2.4665	8 11 1.7	10.704	3	12 14 50.71	2.3600	0 58 29.8	11.602
4	10 21 32.48	2.4643	8 0 17.8	10.759	4	12 17 12.25	2.3580	1 10 5.4	11.584
5	10 24 0.27	2.4620	7 49 30.6	10.813	5	12 19 33.67	2.3561	1 21 39.9	11.565
6	10 26 27.92	2.4597	7 38 40.2	10.866	6	12 21 54.98	2.3543	1 33 13.2	11.545
7	10 28 55.43	2.4574	7 27 46.7	10.916	7	12 24 16.18	2.3524	1 44 45.3	11.523
8	10 31 22.81	2.4552	7 16 50.3	10.964	8	12 26 37.27	2.3505	1 56 16.0	11.500
9	10 33 50.05	2.4528	7 5 51.0	11.012	9	12 28 58.24	2.3486	2 7 45.3	11.475
10	10 36 17.15	2.4505	6 54 48.9	11.058	10	12 31 19.10	2.3468	2 19 13.0	11.448
11	10 38 44.11	2.4482	6 43 44.1	11.102	11	12 33 39.86	2.3450	2 30 39.1	11.422
12	10 41 10.93	2.4458	6 32 36.7	11.144	12	12 36 0.50	2.3432	2 42 3.6	11.393
13	10 43 37.61	2.4435	6 21 26.8	11.185	13	12 38 21.04	2.3414	2 53 26.3	11.363
14	10 46 4.15	2.4412	6 10 14.5	11.225	14	12 40 41.47	2.3397	3 4 47.1	11.331
15	10 48 30.55	2.4388	5 58 59.8	11.263	15	12 43 1.80	2.3380	3 16 6.0	11.299
16	10 50 56.81	2.4365	5 47 42.9	11.300	16	12 45 22.03	2.3362	3 27 23.0	11.266
17	10 53 22.93	2.4342	5 36 23.8	11.335	17	12 47 42.15	2.3345	3 38 37.9	11.231
18	10 55 48.91	2.4319	5 25 2.7	11.368	18	12 50 2.17	2.3329	3 49 50.7	11.194
19	10 58 14.76	2.4296	5 13 39.7	11.399	19	12 52 22.10	2.3313	4 1 1.2	11.157
20	11 0 40.46	2.4272	5 2 14.8	11.430	20	12 54 41.92	2.3295	4 12 9.5	11.119
21	11 3 6.02	2.4249	4 50 48.1	11.458	21	12 57 1.64	2.3279	4 23 15.5	11.079
22	11 5 31.45	2.4226	4 39 19.8	11.485	22	12 59 21.27	2.3263	4 34 19.0	11.038
23	11 7 56.73	2.4203	N. 4 27 49.9	11.510	23	13 1 40.80	2.3248	S. 4 45 20.0	10.996
WEDNESDAY 2.					FRIDAY 4.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	11 10 21.88	2.4180	N. 4 16 18.6	11.533	0	13 4 0.24	2.3232	S. 4 56 18.5	10.953
1	11 12 46.89	2.4157	4 4 45.9	11.557	1	13 6 19.58	2.3216	5 7 14.4	10.908
2	11 15 11.76	2.4133	3 53 11.8	11.578	2	13 8 38.83	2.3201	5 18 7.5	10.863
3	11 17 36.49	2.4111	3 41 36.6	11.596	3	13 10 57.99	2.3186	5 28 57.9	10.817
4	11 20 1.09	2.4088	3 30 0.3	11.614	4	13 13 17.06	2.3171	5 39 45.5	10.768
5	11 22 25.55	2.4066	3 18 22.9	11.630	5	13 15 36.04	2.3156	5 50 30.1	10.719
6	11 24 49.88	2.4043	3 6 44.7	11.644	6	13 17 54.93	2.3141	6 1 11.8	10.670
7	11 27 14.07	2.4021	2 55 5.6	11.658	7	13 20 13.73	2.3126	6 11 50.5	10.619
8	11 29 38.13	2.3998	2 43 25.7	11.669	8	13 22 32.44	2.3112	6 22 26.1	10.567
9	11 32 2.05	2.3976	2 31 45.3	11.678	9	13 24 51.07	2.3098	6 32 58.6	10.514
10	11 34 25.84	2.3954	2 20 4.3	11.687	10	13 27 9.62	2.3084	6 43 27.8	10.460
11	11 36 49.50	2.3932	2 8 22.8	11.695	11	13 29 28.08	2.3070	6 53 53.8	10.406
12	11 39 13.02	2.3910	1 56 40.9	11.700	12	13 31 46.46	2.3057	7 4 16.5	10.349
13	11 41 36.42	2.3888	1 44 58.8	11.703	13	13 34 4.76	2.3043	7 14 35.7	10.292
14	11 43 59.68	2.3867	1 33 16.5	11.706	14	13 36 22.97	2.3029	7 24 51.5	10.234
15	11 46 22.82	2.3846	1 21 34.1	11.707	15	13 38 41.11	2.3016	7 35 3.8	10.176
16	11 48 45.83	2.3824	1 9 51.7	11.706	16	13 40 59.16	2.3003	7 45 12.6	10.116
17	11 51 8.71	2.3803	0 58 9.4	11.703	17	13 43 17.14	2.2990	7 55 17.7	10.055
18	11 53 31.46	2.3782	0 46 27.3	11.700	18	13 45 35.04	2.2977	8 5 19.2	9.993
19	11 55 54.09	2.3762	0 34 45.4	11.695	19	13 47 52.86	2.2963	8 15 16.9	9.931
20	11 58 16.60	2.3741	0 23 3.9	11.688	20	13 50 10.60	2.2951	8 25 10.9	9.867
21	12 0 38.98	2.3720	N. 0 11 22.8	11.681	21	13 52 28.27	2.2939	8 35 1.0	9.803
22	12 3 1.24	2.3699	S. 0 0 17.8	11.671	22	13 54 45.87	2.2927	8 44 47.3	9.738
23	12 5 23.37	2.3678	0 11 57.7	11.660	23	13 57 3.39	2.2913	8 54 29.6	9.673
24	12 7 45.38	2.3659	S. 0 23 37.0	11.648	24	13 59 20.83	2.2902	S. 9 4 8.0	9.606

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 5.					MONDAY 7.				
0	13 59 20.83	2.2902	S. 9 4 8.0	9.606	0	15 48 0.35	2.2380	S. 15 15 52.0	5.691
1	14 1 38.21	2.2890	9 13 42.3	9.538	1	15 50 14.60	2.2368	15 21 30.7	5.600
2	14 3 55.51	2.2878	9 23 12.6	9.470	2	15 52 28.77	2.2357	15 27 4.0	5.508
3	14 6 12.74	2.2866	9 32 38.7	9.400	3	15 54 42.88	2.2346	15 32 31.7	5.416
4	14 8 29.90	2.2855	9 42 0.6	9.331	4	15 56 56.92	2.2333	15 37 53.9	5.324
5	14 10 47.00	2.2843	9 51 18.4	9.260	5	15 59 10.88	2.2322	15 43 10.6	5.233
6	14 13 4.02	2.2831	10 0 31.8	9.188	6	16 1 24.78	2.2311	15 48 21.8	5.140
7	14 15 20.97	2.2820	10 9 41.0	9.117	7	16 3 38.61	2.2299	15 53 27.4	5.047
8	14 17 37.86	2.2809	10 18 45.8	9.043	8	16 5 52.37	2.2288	15 58 27.4	4.954
9	14 19 54.68	2.2798	10 27 46.2	8.970	9	16 8 6.06	2.2276	16 3 21.9	4.862
10	14 22 11.43	2.2786	10 36 42.2	8.896	10	16 10 19.68	2.2263	16 8 10.8	4.768
11	14 24 28.11	2.2775	10 45 33.7	8.821	11	16 12 33.22	2.2251	16 12 54.1	4.675
12	14 26 44.73	2.2764	10 54 20.7	8.746	12	16 14 46.69	2.2239	16 17 31.8	4.583
13	14 29 1.28	2.2753	11 3 3.2	8.669	13	16 17 0.09	2.2227	16 22 4.0	4.489
14	14 31 17.77	2.2743	11 11 41.0	8.592	14	16 19 13.41	2.2214	16 26 30.5	4.395
15	14 33 34.19	2.2732	11 20 14.2	8.515	15	16 21 26.66	2.2202	16 30 51.4	4.302
16	14 35 50.55	2.2721	11 28 42.8	8.437	16	16 23 39.83	2.2189	16 35 6.7	4.208
17	14 38 6.84	2.2710	11 37 6.6	8.358	17	16 25 52.93	2.2177	16 39 16.4	4.115
18	14 40 23.07	2.2699	11 45 25.7	8.279	18	16 28 5.95	2.2165	16 43 20.5	4.022
19	14 42 39.23	2.2688	11 53 40.1	8.200	19	16 30 18.89	2.2150	16 47 19.0	3.928
20	14 44 55.33	2.2678	12 1 49.7	8.119	20	16 32 31.75	2.2137	16 51 11.8	3.833
21	14 47 11.36	2.2657	12 9 54.4	8.038	21	16 34 44.53	2.2124	16 54 59.0	3.740
22	14 49 27.33	2.2657	12 17 54.2	7.956	22	16 36 57.24	2.2111	16 58 40.6	3.646
23	14 51 43.24	2.2646	S. 12 25 49.1	7.874	23	16 39 9.86	2.2097	S. 17 2 16.5	3.551
SUNDAY 6.					TUESDAY 8.				
0	14 53 59.08	2.2635	S. 12 33 39.1	7.792	0	16 41 22.40	2.2083	S. 17 5 46.7	3.457
1	14 56 14.86	2.2625	12 41 24.1	7.709	1	16 43 34.86	2.2070	17 9 11.3	3.363
2	14 58 30.58	2.2615	12 49 4.2	7.626	2	16 45 47.24	2.2056	17 12 30.3	3.270
3	15 0 46.24	2.2604	12 56 39.2	7.542	3	16 47 59.53	2.2042	17 15 43.7	3.176
4	15 3 1.83	2.2593	13 4 9.2	7.458	4	16 50 11.74	2.2028	17 18 51.4	3.082
5	15 5 17.36	2.2583	13 11 34.1	7.373	5	16 52 23.86	2.2013	17 21 53.5	2.987
6	15 7 32.82	2.2573	13 18 53.9	7.288	6	16 54 35.60	2.1999	17 24 49.9	2.893
7	15 9 48.23	2.2563	13 26 8.6	7.202	7	16 56 47.85	2.1984	17 27 40.7	2.800
8	15 12 3.57	2.2552	13 33 18.1	7.115	8	16 58 59.71	2.1969	17 30 25.9	2.707
9	15 14 18.85	2.2541	13 40 22.4	7.029	9	17 1 11.48	2.1954	17 33 5.5	2.613
10	15 16 34.06	2.2530	13 47 21.6	6.943	10	17 3 23.16	2.1940	17 35 39.4	2.518
11	15 18 49.21	2.2520	13 54 15.5	6.855	11	17 5 34.76	2.1925	17 38 7.7	2.425
12	15 21 4.30	2.2510	14 1 4.2	6.768	12	17 7 46.26	2.1909	17 40 30.4	2.332
13	15 23 19.33	2.2499	14 7 47.6	6.680	13	17 9 57.67	2.1894	17 42 47.5	2.238
14	15 25 34.29	2.2488	14 14 25.8	6.592	14	17 12 8.99	2.1878	17 44 59.0	2.145
15	15 27 49.18	2.2478	14 20 58.6	6.503	15	17 14 20.21	2.1863	17 47 4.9	2.051
16	15 30 4.02	2.2467	14 27 26.1	6.413	16	17 16 31.34	2.1847	17 49 5.1	1.958
17	15 32 18.79	2.2456	14 33 48.2	6.324	17	17 18 42.37	2.1831	17 50 59.8	1.866
18	15 34 33.49	2.2445	14 40 5.0	6.235	18	17 20 53.31	2.1815	17 52 49.0	1.773
19	15 36 48.13	2.2434	14 46 16.4	6.145	19	17 23 4.15	2.1798	17 54 32.5	1.679
20	15 39 2.70	2.2423	14 52 22.4	6.055	20	17 25 14.89	2.1782	17 56 10.5	1.587
21	15 41 17.21	2.2413	14 58 23.0	5.964	21	17 27 25.53	2.1766	17 57 42.9	1.494
22	15 43 31.66	2.2402	15 4 18.1	5.873	22	17 29 36.08	2.1750	17 59 9.8	1.402
23	15 45 46.04	2.2391	15 10 7.8	5.783	23	17 31 46.53	2.1733	18 0 31.1	1.309
24	15 48 0.35	2.2380	S. 15 15 52.0	5.691	24	17 33 56.88	2.1716	S. 18 1 46.9	1.218

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 9.					FRIDAY 11.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	17 33 56.88	2.1716	S. 18 1 46.9	1.218	0	19 16 0.41	2.0773	S. 17 18 16.8	2.922
1	17 36 7.12	2.1698	18 2 57.2	1.125	1	19 18 4.99	2.0752	17 15 19.1	3.001
2	17 38 17.26	2.1682	18 4 1.9	1.033	2	19 20 9.43	2.0730	17 12 16.7	3.078
3	17 40 27.30	2.1664	18 5 1.2	0.942	3	19 22 13.75	2.0709	17 9 9.7	3.156
4	17 42 37.23	2.1647	18 5 54.9	0.850	4	19 24 17.94	2.0688	17 5 58.0	3.233
5	17 44 47.06	2.1629	18 6 43.2	0.759	5	19 26 22.00	2.0666	17 2 41.7	3.311
6	17 46 56.78	2.1611	18 7 26.0	0.668	6	19 28 25.93	2.0645	16 59 20.7	3.388
7	17 49 6.39	2.1593	18 8 3.4	0.578	7	19 30 29.74	2.0623	16 55 55.2	3.463
8	17 51 15.90	2.1576	18 8 35.3	0.487	8	19 32 33.41	2.0602	16 52 25.1	3.539
9	17 53 25.30	2.1558	18 9 1.8	0.396	9	19 34 36.96	2.0581	16 48 50.5	3.614
10	17 55 34.59	2.1539	18 9 22.8	0.305	10	19 36 40.38	2.0558	16 45 11.4	3.690
11	17 57 43.77	2.1521	18 9 38.4	0.215	11	19 38 43.66	2.0537	16 41 27.7	3.765
12	17 59 52.84	2.1503	18 9 48.6	0.126	12	19 40 46.82	2.0517	16 37 39.6	3.838
13	18 2 1.80	2.1484	18 9 53.5	-0.036	13	19 42 49.86	2.0495	16 33 47.1	3.913
14	18 4 10.65	2.1465	18 9 52.9	+0.054	14	19 44 52.76	2.0473	16 29 50.1	3.987
15	18 6 19.38	2.1446	18 9 47.0	0.143	15	19 46 55.54	2.0453	16 25 48.7	4.059
16	18 8 28.00	2.1428	18 9 35.8	0.231	16	19 48 58.19	2.0431	16 21 43.0	4.132
17	18 10 36.51	2.1408	18 9 19.3	0.320	17	19 51 0.71	2.0410	16 17 32.9	4.204
18	18 12 44.90	2.1388	18 8 57.4	0.408	18	19 53 3.11	2.0389	16 13 18.5	4.276
19	18 14 53.17	2.1369	18 8 30.3	0.497	19	19 55 5.38	2.0368	16 8 59.8	4.347
20	18 17 1.33	2.1350	18 7 57.8	0.585	20	19 57 7.52	2.0347	16 4 36.9	4.418
21	18 19 9.37	2.1331	18 7 20.1	0.672	21	19 59 9.54	2.0326	16 0 9.7	4.489
22	18 21 17.30	2.1311	18 6 37.2	0.759	22	20 1 11.43	2.0304	15 55 38.2	4.559
23	18 23 25.10	2.1291	S. 18 5 49.0	0.847	23	20 3 13.19	2.0283	S. 15 51 2.6	4.628
THURSDAY 10.					SATURDAY 12.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	18 25 32.79	2.1272	S. 18 4 55.6	0.933	0	20 5 14.82	2.0262	S. 15 46 22.8	4.698
1	18 27 40.36	2.1252	18 3 57.0	1.020	1	20 7 16.33	2.0242	15 41 38.9	4.767
2	18 29 47.81	2.1231	18 2 53.2	1.106	2	20 9 17.72	2.0221	15 36 50.8	4.836
3	18 31 55.13	2.1211	18 1 44.3	1.192	3	20 11 18.98	2.0200	15 31 58.6	4.903
4	18 34 2.34	2.1191	18 0 30.2	1.278	4	20 13 20.12	2.0179	15 27 2.4	4.971
5	18 36 9.42	2.1171	17 59 10.9	1.363	5	20 15 21.13	2.0158	15 22 2.1	5.038
6	18 38 16.39	2.1151	17 57 46.6	1.448	6	20 17 22.02	2.0138	15 16 57.8	5.105
7	18 40 23.23	2.1129	17 56 17.2	1.533	7	20 19 22.79	2.0118	15 11 49.5	5.171
8	18 42 29.94	2.1109	17 54 42.7	1.618	8	20 21 23.44	2.0098	15 6 37.3	5.237
9	18 44 36.54	2.1089	17 53 3.1	1.702	9	20 23 23.97	2.0077	15 1 21.1	5.303
10	18 46 43.01	2.1068	17 51 18.5	1.785	10	20 25 24.37	2.0057	14 56 1.0	5.367
11	18 48 49.36	2.1048	17 49 28.9	1.868	11	20 27 24.65	2.0038	14 50 37.1	5.431
12	18 50 55.58	2.1027	17 47 34.3	1.952	12	20 29 24.82	2.0018	14 45 9.3	5.495
13	18 53 1.68	2.1006	17 45 34.7	2.034	13	20 31 24.87	1.9998	14 39 37.7	5.558
14	18 55 7.65	2.0985	17 43 30.2	2.117	14	20 33 24.80	1.9978	14 34 2.3	5.622
15	18 57 13.50	2.0964	17 41 20.7	2.199	15	20 35 24.61	1.9958	14 28 23.1	5.684
16	18 59 19.22	2.0943	17 39 6.3	2.281	16	20 37 24.30	1.9939	14 22 40.2	5.747
17	19 1 24.81	2.0922	17 36 47.0	2.362	17	20 39 23.88	1.9920	14 16 53.5	5.808
18	19 3 30.28	2.0901	17 34 22.8	2.443	18	20 41 23.34	1.9901	14 11 3.2	5.869
19	19 5 35.62	2.0879	17 31 53.8	2.523	19	20 43 22.69	1.9882	14 5 9.2	5.929
20	19 7 40.83	2.0858	17 29 20.0	2.604	20	20 45 21.93	1.9863	13 59 11.7	5.989
21	19 9 45.92	2.0837	17 26 41.3	2.684	21	20 47 21.05	1.9844	13 53 10.5	6.050
22	19 11 50.88	2.0816	17 23 57.9	2.763	22	20 49 20.06	1.9825	13 47 5.7	6.109
23	19 13 55.71	2.0794	17 21 9.7	2.843	23	20 51 18.95	1.9807	13 40 57.4	6.168
24	19 16 0.41	2.0773	S. 17 18 16.8	2.922	24	20 53 17.74	1.9789	S. 13 34 45.6	6.226

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 13.					TUESDAY 15.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	20 53 17.74	1.9789	S. 13 34 45.6	6.226	0	22 26 31.14	1.9139	S. 7 37 58.4	8.444
1	20 55 16.42	1.9770	13 28 30.3	6.284	1	22 28 25.95	1.9132	7 29 30.7	8.477
2	20 57 14.98	1.9752	13 22 11.5	6.342	2	22 30 20.72	1.9124	7 21 1.1	8.510
3	20 59 13.44	1.9734	13 15 49.3	6.399	3	22 32 15.44	1.9118	7 12 29.5	8.543
4	21 1 11.79	1.9717	13 9 23.6	6.456	4	22 34 10.13	1.9111	7 3 56.0	8.574
5	21 3 10.04	1.9699	13 2 54.6	6.511	5	22 36 4.77	1.9104	6 55 20.6	8.606
6	21 5 8.18	1.9682	12 56 22.3	6.567	6	22 37 59.38	1.9098	6 46 43.3	8.636
7	21 7 6.22	1.9665	12 49 46.6	6.623	7	22 39 53.95	1.9092	6 38 4.3	8.666
8	21 9 4.16	1.9648	12 43 7.6	6.677	8	22 41 48.48	1.9086	6 29 23.4	8.696
9	21 11 1.99	1.9630	12 36 25.4	6.730	9	22 43 42.98	1.9081	6 20 40.8	8.724
10	21 12 59.72	1.9613	12 29 40.0	6.783	10	22 45 37.45	1.9077	6 11 56.5	8.753
11	21 14 57.35	1.9597	12 22 51.4	6.837	11	22 47 31.90	1.9073	6 3 10.4	8.782
12	21 16 54.89	1.9582	12 15 59.6	6.889	12	22 49 26.32	1.9068	5 54 22.7	8.808
13	21 18 52.33	1.9565	12 9 4.7	6.942	13	22 51 20.71	1.9063	5 45 33.4	8.835
14	21 20 49.67	1.9549	12 2 6.6	6.993	14	22 53 15.08	1.9060	5 36 42.5	8.862
15	21 22 46.92	1.9533	11 55 5.5	7.044	15	22 55 9.43	1.9056	5 27 50.0	8.888
16	21 24 44.07	1.9518	11 48 1.3	7.096	16	22 57 3.75	1.9053	5 18 56.0	8.912
17	21 26 41.13	1.9502	11 40 54.0	7.146	17	22 58 58.06	1.9050	5 10 0.6	8.936
18	21 28 38.09	1.9487	11 33 43.8	7.194	18	23 0 52.35	1.9048	5 1 3.7	8.961
19	21 30 34.97	1.9473	11 26 30.7	7.243	19	23 2 46.63	1.9046	4 52 5.3	8.984
20	21 32 31.76	1.9458	11 19 14.6	7.292	20	23 4 40.90	1.9043	4 43 5.6	9.007
21	21 34 28.46	1.9443	11 11 55.6	7.340	21	23 6 35.15	1.9041	4 34 4.5	9.029
22	21 36 25.07	1.9428	11 4 33.8	7.388	22	23 8 29.39	1.9040	4 25 2.1	9.051
23	21 38 21.60	1.9414	S. 10 57 9.1	7.436	23	23 10 23.63	1.9040	S. 4 15 58.4	9.071
MONDAY 14.					WEDNESDAY 16.				
0	21 40 18.04	1.9400	S. 10 49 41.5	7.483	0	23 12 17.87	1.9039	S. 4 6 53.6	9.091
1	21 42 14.40	1.9387	10 42 11.2	7.528	1	23 14 12.10	1.9038	3 57 47.5	9.112
2	21 44 10.68	1.9373	10 34 38.2	7.573	2	23 16 6.33	1.9038	3 48 40.2	9.132
3	21 46 6.88	1.9360	10 27 2.4	7.619	3	23 18 0.56	1.9038	3 39 31.7	9.151
4	21 48 3.00	1.9347	10 19 23.9	7.663	4	23 19 54.79	1.9039	3 30 22.1	9.168
5	21 49 59.04	1.9334	10 11 42.8	7.708	5	23 21 49.03	1.9041	3 21 11.5	9.186
6	21 51 55.01	1.9322	10 3 59.0	7.751	6	23 23 43.28	1.9042	3 11 59.8	9.203
7	21 53 50.90	1.9309	9 56 12.7	7.793	7	23 25 37.53	1.9043	3 2 47.1	9.219
8	21 55 46.72	1.9298	9 48 23.8	7.836	8	23 27 31.79	1.9045	2 53 33.5	9.234
9	21 57 42.47	1.9286	9 40 32.4	7.878	9	23 29 26.07	1.9048	2 44 19.0	9.249
10	21 59 38.15	1.9274	9 32 38.4	7.920	10	23 31 20.36	1.9050	2 35 3.6	9.264
11	22 1 33.76	1.9263	9 24 42.0	7.960	11	23 33 14.67	1.9053	2 25 47.3	9.278
12	22 3 29.30	1.9252	9 16 43.2	8.001	12	23 35 8.99	1.9056	2 16 30.2	9.292
13	22 5 24.78	1.9241	9 8 41.9	8.041	13	23 37 3.34	1.9060	2 7 12.3	9.305
14	22 7 20.19	1.9230	9 0 38.3	8.080	14	23 38 57.71	1.9063	1 57 53.6	9.317
15	22 9 15.54	1.9220	8 52 32.3	8.119	15	23 40 52.10	1.9068	1 48 34.3	9.328
16	22 11 10.83	1.9210	8 44 24.0	8.158	16	23 42 46.52	1.9073	1 39 14.2	9.339
17	22 13 6.06	1.9200	8 36 13.4	8.195	17	23 44 40.97	1.9078	1 29 53.6	9.349
18	22 15 1.23	1.9190	8 28 0.6	8.232	18	23 46 35.45	1.9083	1 20 32.3	9.360
19	22 16 56.34	1.9181	8 19 45.6	8.268	19	23 48 29.96	1.9088	1 11 10.4	9.369
20	22 18 51.40	1.9173	8 11 28.4	8.305	20	23 50 24.51	1.9094	1 1 48.0	9.377
21	22 20 46.41	1.9164	8 3 9.0	8.340	21	23 52 19.09	1.9101	0 52 25.2	9.384
22	22 22 41.37	1.9156	7 54 47.6	8.375	22	23 54 13.72	1.9108	0 43 1.9	9.392
23	22 24 36.28	1.9148	7 46 24.0	8.410	23	23 56 8.38	1.9114	0 33 38.1	9.399
24	22 26 31.14	1.9139	S. 7 37 58.4	8.444	24	23 58 3.09	1.9122	S. 0 24 14.0	9.404

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 17.					SATURDAY 19.				
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	23 58 3.09	1.9122	S. 0 24 14.0	9.404	0	1 31 20.29	1.9880	N. 7 1 54.1	8.927
1	23 59 57.84	1.9129	0 14 49.6	9.410	1	1 33 19.64	1.9901	7 10 48.9	8.900
2	0 1 52.64	1.9137	S. 0 5 24.8	9.416	2	1 35 19.14	1.9928	7 19 42.1	8.872
3	0 3 47.49	1.9146	N. 0 4 0.3	9.419	3	1 37 18.78	1.9953	7 28 33.6	8.844
4	0 5 42.39	1.9154	0 13 25.5	9.423	4	1 39 18.58	1.9978	7 37 23.4	8.816
5	0 7 37.34	1.9163	0 22 51.0	9.426	5	1 41 18.52	2.0003	7 46 11.5	8.786
6	0 9 32.35	1.9173	0 32 16.6	9.428	6	1 43 18.62	2.0029	7 54 57.7	8.755
7	0 11 27.41	1.9183	0 41 42.3	9.429	7	1 45 18.87	2.0055	8 3 42.1	8.724
8	0 13 22.54	1.9193	0 51 8.1	9.431	8	1 47 19.28	2.0082	8 12 24.6	8.692
9	0 15 17.73	1.9203	1 0 34.0	9.432	9	1 49 19.85	2.0108	8 21 5.2	8.660
10	0 17 12.98	1.9214	1 9 59.9	9.431	10	1 51 20.58	2.0135	8 29 43.8	8.627
11	0 19 8.30	1.9226	1 19 25.7	9.429	11	1 53 21.47	2.0162	8 38 20.4	8.593
12	0 21 3.69	1.9237	1 28 51.4	9.428	12	1 55 22.52	2.0189	8 46 54.9	8.558
13	0 22 59.15	1.9248	1 38 17.0	9.426	13	1 57 23.74	2.0217	8 55 27.3	8.523
14	0 24 54.67	1.9260	1 47 42.5	9.423	14	1 59 25.13	2.0246	9 3 57.6	8.487
15	0 26 50.27	1.9273	1 57 7.8	9.420	15	2 1 26.69	2.0274	9 12 25.7	8.449
16	0 28 45.95	1.9286	2 6 32.9	9.416	16	2 3 28.42	2.0303	9 20 51.5	8.412
17	0 30 41.70	1.9299	2 15 57.7	9.411	17	2 5 30.32	2.0331	9 29 15.1	8.373
18	0 32 37.54	1.9313	2 25 22.2	9.405	18	2 7 32.39	2.0360	9 37 36.3	8.334
19	0 34 33.46	1.9327	2 34 46.3	9.399	19	2 9 34.64	2.0390	9 45 55.2	8.294
20	0 36 29.46	1.9341	2 44 10.1	9.393	20	2 11 37.07	2.0420	9 54 11.6	8.253
21	0 38 25.55	1.9356	2 53 33.4	9.385	21	2 13 39.68	2.0450	10 2 25.6	8.212
22	0 40 21.73	1.9371	3 2 56.3	9.377	22	2 15 42.47	2.0480	10 10 37.0	8.169
23	0 42 18.00	1.9386	N. 3 12 18.7	9.368	23	2 17 45.44	2.0510	N. 10 18 45.9	8.127
FRIDAY 18.					SUNDAY 20.				
0	0 44 14.36	1.9404	N. 3 21 40.5	9.359	0	2 19 48.59	2.0541	N. 10 26 52.2	8.083
1	0 46 10.82	1.9417	3 31 1.8	9.349	1	2 21 51.93	2.0573	10 34 55.8	8.038
2	0 48 7.37	1.9433	3 40 22.4	9.338	2	2 23 55.46	2.0604	10 42 56.8	7.994
3	0 50 4.02	1.9450	3 49 42.3	9.326	3	2 25 59.18	2.0635	10 50 55.1	7.948
4	0 52 0.77	1.9468	3 59 1.5	9.314	4	2 28 3.08	2.0667	10 58 50.5	7.900
5	0 53 57.63	1.9485	4 8 20.0	9.302	5	2 30 7.18	2.0699	11 6 43.1	7.853
6	0 55 54.59	1.9503	4 17 37.7	9.288	6	2 32 11.47	2.0731	11 14 32.9	7.805
7	0 57 51.67	1.9522	4 26 54.5	9.273	7	2 34 15.95	2.0763	11 22 19.7	7.756
8	0 59 48.85	1.9539	4 36 10.5	9.259	8	2 36 20.63	2.0797	11 30 3.6	7.707
9	1 1 46.14	1.9558	4 45 25.6	9.243	9	2 38 25.51	2.0829	11 37 44.5	7.656
10	1 3 43.55	1.9578	4 54 39.7	9.227	10	2 40 30.58	2.0863	11 45 22.3	7.604
11	1 5 41.07	1.9597	5 3 52.8	9.210	11	2 42 35.86	2.0896	11 52 57.0	7.552
12	1 7 38.71	1.9617	5 13 4.9	9.193	12	2 44 41.33	2.0929	12 0 28.5	7.499
13	1 9 36.47	1.9637	5 22 15.9	9.174	13	2 46 47.01	2.0963	12 7 56.9	7.446
14	1 11 34.35	1.9657	5 31 25.8	9.155	14	2 48 52.89	2.0998	12 15 22.0	7.392
15	1 13 32.35	1.9678	5 40 34.5	9.136	15	2 50 58.98	2.1032	12 22 43.9	7.337
16	1 15 30.48	1.9699	5 49 42.1	9.116	16	2 53 5.27	2.1066	12 30 2.4	7.280
17	1 17 28.74	1.9721	5 58 48.4	9.094	17	2 55 11.77	2.1100	12 37 17.5	7.223
18	1 19 27.13	1.9743	6 7 53.4	9.073	18	2 57 18.47	2.1135	12 44 29.2	7.167
19	1 21 25.65	1.9764	6 16 57.1	9.050	19	2 59 25.39	2.1170	12 51 37.5	7.108
20	1 23 24.30	1.9787	6 25 5.4	9.027	20	3 1 32.51	2.1204	12 58 42.2	7.049
21	1 25 23.09	1.9810	6 35 0.3	9.003	21	3 3 39.84	2.1240	13 5 43.4	6.990
22	1 27 22.02	1.9833	6 43 59.7	8.978	22	3 5 47.39	2.1276	13 12 41.0	6.929
23	1 29 21.08	1.9856	6 52 57.7	8.953	23	3 7 55.15	2.1311	13 19 34.9	6.867
24	1 31 20.29	1.9880	N. 7 1 54.1	8.927	24	3 10 3.12	2.1347	N. 13 26 25.0	6.804



## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.		
MONDAY 21.							WEDNESDAY 23.								
0	h	m	s	s	°	"	0	h	m	s	s	°	"		
0	3	10	3.12	2.1347	N.13	26 25.0	6.804	0	4	56	43.73	2.3088	N.17	27 11.7	2.947
1	3	12	11.31	2.1383	13	33 11.4	6.742	1	4	59	2.36	2.3121	17	30 5.6	2.850
2	3	14	19.71	2.1418	13	39 54.1	6.679	2	5	1	21.18	2.3153	17	32 53.7	2.753
3	3	16	28.33	2.1454	13	46 32.9	6.614	3	5	3	40.20	2.3187	17	35 35.9	2.654
4	3	18	37.16	2.1490	13	53 7.8	6.549	4	5	5	59.42	2.3220	17	38 12.2	2.555
5	3	20	46.21	2.1527	13	59 38.8	6.484	5	5	8	18.84	2.3253	17	40 42.5	2.454
6	3	22	55.48	2.1563	14	6 5.9	6.418	6	5	10	38.45	2.3285	17	43 6.7	2.354
7	3	25	4.97	2.1600	14	12 28.9	6.349	7	5	12	58.26	2.3317	17	45 25.0	2.254
8	3	27	14.68	2.1636	14	18 47.8	6.281	8	5	15	18.25	2.3348	17	47 37.2	2.153
9	3	29	24.60	2.1673	14	25 2.6	6.213	9	5	17	38.44	2.3380	17	49 43.3	2.050
10	3	31	34.75	2.1710	14	31 13.3	6.143	10	5	19	58.81	2.3411	17	51 43.2	1.947
11	3	33	45.12	2.1746	14	37 19.7	6.072	11	5	22	19.37	2.3442	17	53 36.9	1.844
12	3	35	55.70	2.1783	14	43 21.9	6.001	12	5	24	40.11	2.3473	17	55 24.5	1.741
13	3	38	6.51	2.1810	14	49 19.8	5.929	13	5	27	1.04	2.3503	17	57 5.8	1.637
14	3	40	17.54	2.1857	14	55 13.4	5.856	14	5	29	22.14	2.3532	17	58 40.9	1.533
15	3	42	28.80	2.1894	15	1 2.5	5.782	15	5	31	43.42	2.3562	18	0 9.7	1.428
16	3	44	40.27	2.1931	15	6 47.2	5.708	16	5	34	4.88	2.3591	18	1 32.2	1.322
17	3	46	51.97	2.1968	15	12 27.5	5.633	17	5	36	26.51	2.3619	18	2 48.3	1.215
18	3	49	3.89	2.2005	15	18 3.2	5.557	18	5	38	48.31	2.3648	18	3 58.0	1.108
19	3	51	16.03	2.2043	15	23 34.3	5.480	19	5	41	10.28	2.3675	18	5 1.3	1.002
20	3	53	28.40	2.2080	15	29 0.8	5.403	20	5	43	32.41	2.3703	18	5 58.2	0.894
21	3	55	40.99	2.2117	15	34 22.7	5.325	21	5	45	54.71	2.3731	18	6 48.6	0.786
22	3	57	53.80	2.2154	15	39 39.8	5.246	22	5	48	17.18	2.3758	18	7 32.5	0.678
23	4	0	6.84	2.2192	N.15	44 52.2	5.167	23	5	50	39.80	2.3783	N.18	8 9.9	0.568
TUESDAY 22.							THURSDAY 24.								
0	4	2	20.10	2.2228	N.15	49 59.8	5.087	0	5	53	2.58	2.3810	N.18	8 40.7	0.459
1	4	4	33.58	2.2265	15	55 2.6	5.005	1	5	55	25.52	2.3835	18	9 5.0	0.350
2	4	6	47.28	2.2302	16	0 0.4	4.923	2	5	57	48.60	2.3860	18	9 22.7	0.240
3	4	9	1.20	2.2339	16	4 53.3	4.841	3	6	0	11.84	2.3885	18	9 33.8	0.130
4	4	11	15.35	2.2376	16	9 41.3	4.758	4	6	2	35.22	2.3909	18	9 38.3	+ 0.020
5	4	13	29.71	2.2412	16	14 24.3	4.674	5	6	4	58.75	2.3933	18	9 36.2	- 0.092
6	4	15	44.29	2.2449	16	19 2.2	4.589	6	6	7	22.42	2.3957	18	9 27.3	0.203
7	4	17	59.10	2.2487	16	23 35.0	4.503	7	6	9	46.23	2.3980	18	9 11.8	0.314
8	4	20	14.13	2.2523	16	28 2.6	4.418	8	6	12	10.18	2.4003	18	8 49.6	0.427
9	4	22	29.37	2.2558	16	32 25.1	4.332	9	6	14	34.26	2.4024	18	8 20.6	0.539
10	4	24	44.83	2.2595	16	36 42.4	4.244	10	6	16	58.47	2.4045	18	7 44.9	0.651
11	4	27	0.51	2.2632	16	40 54.4	4.155	11	6	19	22.80	2.4066	18	7 2.5	0.763
12	4	29	16.41	2.2668	16	45 1.0	4.066	12	6	21	47.26	2.4087	18	6 13.3	0.877
13	4	31	32.53	2.2703	16	49 2.3	3.977	13	6	24	11.85	2.4108	18	5 17.3	0.990
14	4	33	48.85	2.2738	16	52 58.2	3.886	14	6	26	36.55	2.4127	18	4 14.5	1.103
15	4	36	5.39	2.2775	16	56 48.6	3.795	15	6	29	1.37	2.4146	18	3 4.9	1.217
16	4	38	22.15	2.2811	17	0 33.6	3.704	16	6	31	26.30	2.4165	18	1 48.5	1.330
17	4	40	39.12	2.2846	17	4 13.1	3.612	17	6	33	51.35	2.4184	18	0 25.3	1.444
18	4	42	56.30	2.2881	17	7 47.0	3.518	18	6	36	16.51	2.4202	17	58 55.2	1.558
19	4	45	13.69	2.2915	17	11 15.3	3.425	19	6	38	41.77	2.4218	17	57 18.3	1.673
20	4	47	31.28	2.2950	17	14 38.0	3.332	20	6	41	7.13	2.4235	17	55 34.5	1.788
21	4	49	49.09	2.2985	17	17 55.1	3.237	21	6	43	32.59	2.4251	17	53 43.8	1.902
22	4	52	7.10	2.3018	17	21 6.4	3.140	22	6	45	58.14	2.4267	17	51 46.3	2.016
23	4	54	25.31	2.3053	17	24 11.9	3.044	23	6	48	23.79	2.4283	17	49 41.9	2.131
24	4	56	43.73	2.3088	N.17	27 11.7	2.947	24	6	50	49.54	2.4298	N.17	47 30.6	2.246

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 25.					SUNDAY 27.				
0	h m s	s	N. ° ' "	"	0	h m s	s	N. ° ' "	"
0	6 50 49.54	2.4298	N. 17 47 30.6	2.246	0	8 48 14.29	2.4455	N. 13 50 29.1	7.489
1	6 53 15.37	2.4312	17 45 12.4	2.360	1	8 50 41.00	2.4448	13 42 56.8	7.586
2	6 55 41.29	2.4326	17 42 47.4	2.475	2	8 53 7.67	2.4441	13 35 18.8	7.682
3	6 58 7.28	2.4338	17 40 15.4	2.590	3	8 55 34.29	2.4433	13 27 35.0	7.778
4	7 0 33.35	2.4352	17 37 36.6	2.704	4	8 58 0.87	2.4427	13 19 45.5	7.872
5	7 2 59.50	2.4364	17 34 50.9	2.819	5	9 0 27.41	2.4419	13 11 50.4	7.965
6	7 5 25.72	2.4376	17 31 58.3	2.934	6	9 2 53.90	2.4411	13 3 49.7	8.057
7	7 7 52.01	2.4387	17 28 58.8	3.049	7	9 5 20.34	2.4403	12 55 43.5	8.148
8	7 10 18.36	2.4398	17 25 52.4	3.163	8	9 7 46.73	2.4394	12 47 31.9	8.239
9	7 12 44.78	2.4408	17 22 39.2	3.278	9	9 10 13.07	2.4386	12 39 14.8	8.329
10	7 15 11.26	2.4418	17 19 19.1	3.393	10	9 12 39.36	2.4378	12 30 52.4	8.417
11	7 17 37.79	2.4427	17 15 52.1	3.507	11	9 15 5.60	2.4368	12 22 24.7	8.504
12	7 20 4.38	2.4436	17 12 18.3	3.621	12	9 17 31.78	2.4358	12 13 51.8	8.592
13	7 22 31.02	2.4444	17 8 37.6	3.735	13	9 19 57.90	2.4349	12 5 13.7	8.678
14	7 24 57.71	2.4452	17 4 50.1	3.848	14	9 22 23.97	2.4340	11 56 30.4	8.764
15	7 27 24.44	2.4459	17 0 55.8	3.962	15	9 24 49.98	2.4330	11 47 42.0	8.848
16	7 29 51.22	2.4467	16 56 54.7	4.075	16	9 27 15.93	2.4320	11 38 48.6	8.931
17	7 32 18.04	2.4473	16 52 46.8	4.188	17	9 29 41.82	2.4310	11 29 50.3	9.015
18	7 34 44.89	2.4478	16 48 32.1	4.302	18	9 32 7.65	2.4299	11 20 47.1	9.093
19	7 37 11.78	2.4484	16 44 10.6	4.414	19	9 34 33.41	2.4288	11 11 39.1	9.173
20	7 39 38.70	2.4488	16 39 42.4	4.527	20	9 36 59.11	2.4278	11 2 26.3	9.252
21	7 42 5.64	2.4493	16 35 7.4	4.638	21	9 39 24.75	2.4268	10 53 8.9	9.329
22	7 44 32.61	2.4497	16 30 25.8	4.750	22	9 41 50.32	2.4256	10 43 46.8	9.407
23	7 46 59.61	2.4501	N. 16 25 37.4	4.862	23	9 44 15.82	2.4244	N. 10 34 20.1	9.482
SATURDAY 26.					MONDAY 28.				
0	7 49 26.62	2.4503	N. 16 20 42.4	4.973	0	9 46 41.25	2.4233	N. 10 24 49.0	9.555
1	7 51 53.65	2.4507	16 15 40.7	5.083	1	9 49 6.62	2.4223	10 15 13.5	9.628
2	7 54 20.70	2.4509	16 10 32.4	5.194	2	9 51 31.92	2.4211	10 5 33.6	9.701
3	7 56 47.76	2.4510	16 5 17.4	5.304	3	9 53 57.15	2.4200	9 55 49.4	9.772
4	7 59 14.82	2.4511	15 59 55.9	5.413	4	9 56 22.32	2.4188	9 46 1.0	9.842
5	8 1 41.89	2.4512	15 54 27.8	5.523	5	9 58 47.41	2.4176	9 36 8.4	9.910
6	8 4 8.97	2.4513	15 48 53.1	5.632	6	10 1 12.43	2.4164	9 26 11.8	9.977
7	8 6 36.05	2.4513	15 43 12.0	5.739	7	10 3 37.38	2.4153	9 16 11.2	10.043
8	8 9 3.13	2.4513	15 37 24.4	5.847	8	10 6 2.26	2.4141	9 6 6.6	10.108
9	8 11 30.20	2.4512	15 31 30.3	5.955	9	10 8 27.07	2.4129	8 55 58.2	10.172
10	8 13 57.27	2.4511	15 25 29.8	6.062	10	10 10 51.81	2.4118	8 45 46.0	10.234
11	8 16 24.33	2.4509	15 19 22.9	6.168	11	10 13 16.48	2.4105	8 35 30.1	10.295
12	8 18 51.38	2.4508	15 13 9.7	6.273	12	10 15 41.07	2.4093	8 25 10.6	10.355
13	8 21 18.42	2.4505	15 6 50.1	6.378	13	10 18 5.59	2.4081	8 14 47.5	10.413
14	8 23 45.44	2.4502	15 0 24.3	6.483	14	10 20 30.04	2.4069	8 4 21.0	10.470
15	8 26 12.44	2.4498	14 53 52.2	6.587	15	10 22 54.42	2.4057	7 53 51.1	10.527
16	8 28 39.42	2.4495	14 47 13.9	6.689	16	10 25 18.72	2.4044	7 43 17.8	10.582
17	8 31 6.38	2.4491	14 40 29.5	6.792	17	10 27 42.95	2.4032	7 32 41.3	10.634
18	8 33 33.31	2.4487	14 33 38.9	6.894	18	10 30 7.11	2.4020	7 22 1.7	10.686
19	8 36 0.22	2.4483	14 26 42.2	6.995	19	10 32 31.19	2.4008	7 11 19.0	10.738
20	8 38 27.10	2.4478	14 19 39.5	7.095	20	10 34 55.21	2.3997	7 0 33.2	10.787
21	8 40 53.95	2.4472	14 12 30.8	7.195	21	10 37 19.16	2.3985	6 49 44.6	10.834
22	8 43 20.76	2.4466	14 5 16.1	7.294	22	10 39 43.03	2.3973	6 38 53.1	10.882
23	8 45 47.54	2.4461	13 57 55.5	7.392	23	10 42 6.83	2.3961	6 27 58.8	10.927
24	8 48 14.29	2.4455	N. 13 50 29.1	7.489	24	10 44 30.56	2.3949	N. 6 17 1.9	10.970

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	
TUESDAY 29.					THURSDAY 31.					
0	10 44 30.56	2.3949	N. 6 17 1.9	10.970	0	12 38 16.39	2.3498	S. 2 53 9.2	11.404	
1	10 46 54.22	2.3937	6 6 2.4	11.012	1	12 40 37.36	2.3493	3 4 32.7	11.378	
2	10 49 17.80	2.3925	5 55 0.5	11.053	2	12 42 58.30	2.3487	3 15 54.6	11.351	
3	10 51 41.32	2.3913	5 43 56.1	11.093	3	12 45 19.20	2.3481	3 27 14.8	11.323	
4	10 54 4.76	2.3902	5 32 49.3	11.132	4	12 47 40.07	2.3475	3 38 33.3	11.293	
5	10 56 28.14	2.3891	5 21 40.3	11.169	5	12 50 0.90	2.3468	3 49 50.0	11.262	
6	10 58 51.45	2.3879	5 10 29.0	11.205	6	12 52 21.69	2.3463	4 1 4.8	11.230	
7	11 1 14.69	2.3868	4 59 15.7	11.238	7	12 54 42.45	2.3458	4 12 17.6	11.197	
8	11 3 37.86	2.3856	4 48 0.4	11.272	8	12 57 3.18	2.3452	4 23 28.4	11.163	
9	11 6 0.96	2.3845	4 36 43.1	11.303	9	12 59 23.87	2.3446	4 34 37.1	11.126	
10	11 8 24.00	2.3834	4 25 24.0	11.333	10	13 1 44.53	2.3441	4 45 43.5	11.088	
11	11 10 46.97	2.3823	4 14 3.1	11.362	11	13 4 5.16	2.3436	4 56 47.6	11.049	
12	11 13 9.87	2.3812	4 2 40.6	11.388	12	13 6 25.76	2.3431	5 7 49.4	11.010	
13	11 15 32.71	2.3801	3 51 16.5	11.413	13	13 8 46.33	2.3426	5 18 48.8	10.968	
14	11 17 55.48	2.3790	3 39 51.0	11.438	14	13 11 6.87	2.3420	5 29 45.6	10.925	
15	11 20 18.19	2.3780	3 28 24.0	11.461	15	13 13 27.37	2.3415	5 40 39.8	10.882	
16	11 22 40.84	2.3769	3 16 55.7	11.482	16	13 15 47.85	2.3411	5 51 31.4	10.837	
17	11 25 3.42	2.3758	3 5 26.2	11.502	17	13 18 8.30	2.3406	6 2 20.2	10.791	
18	11 27 25.94	2.3748	2 53 55.5	11.521	18	13 20 28.72	2.3401	6 13 6.3	10.744	
19	11 29 48.40	2.3738	2 42 23.7	11.538	19	13 22 49.11	2.3397	6 23 49.5	10.695	
20	11 32 10.80	2.3728	2 30 51.0	11.553	20	13 25 9.48	2.3392	6 34 29.7	10.645	
21	11 34 33.14	2.3718	2 19 17.4	11.567	21	13 27 29.81	2.3387	6 45 6.9	10.595	
22	11 36 55.42	2.3708	2 7 43.0	11.580	22	13 29 50.12	2.3383	6 55 41.1	10.543	
23	11 39 17.64	2.3698	N. 1 56 7.8	11.591	23	13 32 10.40	2.3378	S. 7 6 12.1	10.489	
WEDNESDAY 30.					FRIDAY, APRIL 1.					
0	11 41 39.80	2.3689	N. 1 44 32.1	11.600	0	13 34 30.66	2.3374	S. 7 16 39.8	10.434	
1	11 44 1.91	2.3680	1 32 55.8	11.608	PHASES OF THE MOON.					
2	11 46 23.96	2.3670	1 21 19.1	11.615						
3	11 48 45.95	2.3661	1 9 42.0	11.621						
4	11 51 7.89	2.3652	0 58 4.6	11.625						
5	11 53 29.78	2.3643	0 46 27.0	11.627						
6	11 55 51.61	2.3634	0 34 49.3	11.628						
7	11 58 13.39	2.3625	0 23 11.6	11.628						
8	12 0 35.11	2.3617	N. 0 11 34.0	11.626						
9	12 2 56.79	2.3609	S. 0 0 3.5	11.623						
10	12 5 18.42	2.3600	0 11 40.7	11.618						
11	12 7 39.99	2.3592	0 23 17.6	11.612						
12	12 10 1.52	2.3584	0 34 54.1	11.604						
13	12 12 23.00	2.3577	0 46 30.1	11.595						
14	12 14 44.44	2.3569	0 58 5.5	11.585						
15	12 17 5.83	2.3561	1 9 40.3	11.573						
16	12 19 27.17	2.3553	1 21 14.3	11.559						
17	12 21 48.47	2.3546	1 32 47.4	11.545						
18	12 24 9.72	2.3539	1 44 19.7	11.529						
19	12 26 30.94	2.3532	1 55 50.9	11.511						
20	12 28 52.11	2.3525	2 7 21.0	11.493						
21	12 31 13.24	2.3518	2 18 50.0	11.473						
22	12 33 34.33	2.3512	2 30 17.8	11.452						
23	12 35 55.38	2.3505	2 41 44.2	11.428						
24	12 38 16.39	2.3498	S. 2 53 9.2	11.404						

GREENWICH MEAN TIME.										
LUNAR DISTANCES.										
Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
1	Aldebaran	W.	83 6 6	1966	85 0 34	1967	86 55 1	1968	88 49 26	1970
	Pollux	W.	40 46 2	2169	42 35 16	2156	44 24 50	2145	46 14 41	2135
	Spica	E.	50 44 3	1987	48 50 8	1989	46 56 16	1991	45 2 27	1995
	Antares	E.	96 28 43	2028	94 35 52	2027	92 43 0	2028	90 50 9	2030
2	Aldebaran	W.	98 20 22	1991	100 14 10	1998	102 7 48	2005	104 1 14	2013
	Pollux	W.	55 26 24	2118	57 16 55	2120	59 7 24	2123	60 57 48	2126
	Regulus	W.	18 28 30	2046	20 20 52	2044	22 13 18	2044	24 5 43	2047
	Spica	E.	35 35 20	2028	33 42 30	2039	31 49 57	2051	29 57 42	2065
	Antares	E.	81 27 9	2053	79 34 57	2061	77 42 57	2069	75 51 10	2078
3	Pollux	W.	70 7 47	2163	71 57 10	2173	73 46 18	2184	75 35 10	2196
	Regulus	W.	33 25 55	2083	35 17 20	2094	37 8 28	2105	38 59 19	2118
	Antares	E.	66 36 15	2138	64 46 13	2152	62 56 33	2168	61 7 17	2184
	α Aquilæ	E.	114 21 11	2576	112 41 43	2575	111 2 13	2575	109 22 44	2577
4	Pollux	W.	84 34 39	2266	86 21 28	2283	88 7 53	2299	89 53 54	2316
	Regulus	W.	48 8 33	2188	49 57 18	2204	51 45 39	2221	53 33 36	2237
	Antares	E.	52 7 27	2279	50 20 56	2300	48 34 57	2324	46 49 32	2347
	α Aquilæ	E.	101 6 55	2615	99 28 20	2627	97 50 1	2640	96 12 0	2654
	VENUS	E.	114 47 42	2575	113 8 12	2592	111 29 6	2610	109 50 24	2628
5	Regulus	W.	62 26 58	2326	64 12 20	2344	65 57 15	2363	67 41 43	2382
	Antares	E.	38 11 38	2487	36 30 7	2520	34 49 22	2556	33 9 27	2595
	α Aquilæ	E.	88 7 10	2741	86 31 24	2760	84 56 4	2782	83 21 13	2804
	VENUS	E.	101 43 19	2726	100 7 13	2746	98 31 34	2767	96 56 23	2787
	SATURN	E.	104 35 32	2366	102 51 8	2384	101 7 10	2403	99 23 40	2422
	SUN	E.	133 29 45	2640	131 51 44	2660	130 14 10	2680	128 37 3	2700
6	Regulus	W.	76 17 16	2477	77 59 1	2496	79 40 20	2515	81 21 12	2534
	Spica	W.	23 2 46	2546	24 42 56	2556	26 22 52	2567	28 2 32	2581
	α Aquilæ	E.	75 34 24	2927	74 2 39	2954	72 31 28	2981	71 0 52	3010
	VENUS	E.	89 7 11	2892	87 34 42	2913	86 2 40	2935	84 31 5	2955
	SATURN	E.	90 52 53	2518	89 12 5	2538	87 31 44	2556	85 51 49	2576
	SUN	E.	120 38 15	2803	119 3 51	2824	117 29 54	2844	115 56 23	2865
7	Regulus	W.	89 39 2	2627	91 17 20	2645	92 55 14	2663	94 32 43	2681
	Spica	W.	36 16 4	2655	37 53 45	2670	39 31 5	2687	41 8 3	2702
	α Aquilæ	E.	63 37 5	3168	62 10 17	3202	60 44 10	3239	59 18 47	3277
	VENUS	E.	76 59 40	3058	75 30 39	3078	74 2 3	3098	72 33 51	3118
	SATURN	E.	77 38 48	2670	76 1 28	2689	74 24 33	2707	72 48 2	2725
	SUN	E.	108 15 19	2965	106 44 22	2985	105 13 50	3003	103 43 41	3022

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
1	Aldebaran	W.	90 43 48	1972	92 38 6	1975	94 32 19	1980	96 26 24	1985
	Pollux	W.	48 4 46	2128	49 55 2	2124	51 45 25	2120	53 35 53	2118
	Spica	E.	43 8 44	1999	41 15 8	2005	39 21 41	2011	37 28 24	2019
	Antares	E.	88 57 21	2033	87 4 38	2036	85 12 0	2041	83 19 30	2047
2	Aldebaran	W.	105 54 28	2022	107 47 28	2032	109 40 13	2043	111 32 41	2053
	Pollux	W.	62 48 7	2132	64 38 18	2138	66 28 19	2145	68 18 9	2153
	Regulus	W.	25 58 4	2052	27 50 18	2058	29 42 22	2065	31 34 15	2074
	Spica	E.	28 5 49	2081	26 14 20	2099	24 23 19	2120	22 32 50	2143
	Antares	E.	73 59 37	2088	72 8 20	2099	70 17 20	2111	68 26 38	2124
3	Pollux	W.	77 23 44	2209	79 11 58	2222	80 59 53	2236	82 47 27	2251
	Regulus	W.	40 49 51	2131	42 40 3	2144	44 29 55	2159	46 19 25	2173
	Antares	E.	59 18 25	2201	57 29 59	2219	55 42 0	2238	53 54 29	2258
	α Aquilæ	E.	107 43 18	2582	106 3 58	2588	104 24 46	2596	102 45 45	2604
4	Pollux	W.	91 39 30	2334	93 24 40	2352	95 9 24	2370	96 53 42	2389
	Regulus	W.	55 21 8	2254	57 8 15	2272	58 54 55	2289	60 41 10	2308
	Antares	E.	45 4 41	2372	43 20 26	2399	41 36 50	2427	39 53 53	2456
	α Aquilæ	E.	94 34 18	2669	92 56 57	2685	91 19 57	2703	89 43 21	2722
	VENUS	E.	108 12 7	2647	106 34 16	2666	104 56 51	2686	103 19 52	2705
5	Regulus	W.	69 25 44	2401	71 9 18	2420	72 52 24	2438	74 35 4	2458
	Antares	E.	31 30 25	2637	29 52 20	2683	28 15 17	2734	26 39 22	2792
	α Aquilæ	E.	81 46 50	2827	80 12 57	2850	78 39 34	2875	77 6 43	2900
	VENUS	E.	95 21 38	2808	93 47 20	2829	92 13 30	2850	90 40 7	2871
	SATURN	E.	97 40 36	2441	95 58 0	2460	94 15 50	2480	92 34 8	2499
	SUN	E.	127 0 23	2720	125 24 10	2741	123 48 25	2762	122 13 7	2782
6	Regulus	W.	83 1 38	2553	84 41 37	2572	86 21 11	2591	88 0 19	2609
	Spica	W.	29 41 53	2594	31 20 56	2609	32 59 39	2624	34 38 2	2639
	α Aquilæ	E.	69 30 51	3039	68 1 27	3070	66 32 41	3101	65 4 33	3134
	VENUS	E.	82 59 56	2977	81 29 14	2997	79 58 57	3018	78 29 6	3038
	SATURN	E.	84 12 21	2595	82 33 19	2614	80 54 43	2633	79 16 33	2652
	SUN	E.	114 23 19	2884	112 50 40	2905	111 18 28	2925	109 46 41	2945
7	Regulus	W.	96 9 49	2699	97 46 31	2715	99 22 51	2732	100 58 48	2749
	Spica	W.	42 44 41	2717	44 20 58	2733	45 56 54	2749	47 32 29	2764
	α Aquilæ	E.	57 54 8	3315	56 30 14	3356	55 7 7	3398	53 44 49	3443
	VENUS	E.	71 6 3	3137	69 38 38	3156	68 11 36	3174	66 44 56	3193
	SATURN	E.	71 11 55	2742	69 36 11	2760	68 0 50	2778	66 25 53	2794
	SUN	E.	102 13 56	3042	100 44 35	3060	99 15 36	3078	97 46 59	3096

GREENWICH MEAN TIME.									
LUNAR DISTANCES.									
Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
8	Spica W.	49 7 44	2779	50 42 39	2794	52 17 15	2809	53 51 31	2823
	α Aquilæ E.	52 23 21	3490	51 2 46	3540	49 43 6	3592	48 24 23	3648
	SATURN E.	64 51 17	2811	63 17 3	2827	61 43 10	2843	60 9 38	2859
	VENUS E.	65 18 39	3211	63 52 43	3229	62 27 8	3247	61 1 54	3264
	SUN E.	96 18 44	3114	94 50 51	3130	93 23 18	3147	91 56 5	3163
9	Spica W.	61 38 23	2890	63 10 54	2902	64 43 10	2914	66 15 11	2927
	Antares W.	18 13 11	3538	19 32 53	3457	20 54 5	3394	22 16 28	3345
	SATURN E.	52 26 51	2932	50 55 13	2946	49 23 53	2959	47 52 49	2973
	VENUS E.	54 0 32	3343	52 37 10	3358	51 14 5	3372	49 51 17	3386
	SUN E.	84 44 45	3239	83 19 22	3253	81 54 15	3266	80 29 24	3279
10	Spica W.	73 51 42	2978	75 22 22	2988	76 52 50	2997	78 23 7	3005
	Antares W.	29 19 5	3219	30 44 52	3207	32 10 53	3197	33 37 6	3189
	SATURN E.	40 21 30	3034	38 51 59	3045	37 22 42	3056	35 53 39	3068
	VENUS E.	43 1 2	3449	41 39 41	3461	40 18 33	3472	38 57 38	3483
	SUN E.	73 28 46	3337	72 5 17	3348	70 42 1	3358	69 18 56	3366
11	Spica W.	85 52 5	3041	87 21 27	3048	88 50 41	3053	90 19 48	3058
	Antares W.	40 49 55	3169	42 16 41	3168	43 43 28	3167	45 10 17	3165
	VENUS E.	32 15 57	3533	30 56 9	3543	29 36 32	3552	28 17 5	3562
	SUN E.	62 25 59	3406	61 3 49	3413	59 41 47	3419	58 19 52	3425
12	Antares W.	52 24 39	3163	53 51 33	3162	55 18 28	3162	56 45 23	3160
	SUN E.	51 31 46	3447	50 10 22	3451	48 49 3	3453	47 27 46	3456
13	Antares W.	64 0 16	3155	65 27 19	3154	66 54 23	3153	68 21 29	3151
	SUN E.	40 41 57	3463	39 20 51	3463	37 59 46	3463	36 38 40	3463
14	Antares W.	75 37 33	3140	77 4 54	3138	78 32 18	3135	79 59 45	3132
	SUN E.	29 53 0	3456	28 31 47	3455	27 10 32	3452	25 49 14	3450
19	SUN W.	25 21 36	3238	26 47 0	3231	28 12 33	3222	29 38 16	3214
	Aldebaran E.	44 42 51	2877	43 10 3	2870	41 37 5	2862	40 3 57	2854
	Pollux E.	88 27 17	2965	86 56 20	2958	85 25 14	2950	83 53 59	2943
20	SUN W.	36 49 25	3170	38 16 10	3161	39 43 6	3151	41 10 14	3142
	Aldebaran E.	32 15 46	2814	30 41 36	2805	29 7 15	2798	27 32 44	2789
	Pollux E.	76 15 27	2908	74 43 18	2901	73 11 0	2893	71 38 32	2887
21	SUN W.	48 28 49	3092	49 57 8	3081	51 25 41	3071	52 54 26	3060
	α Arietis W.	18 48 10	4154	19 57 20	3941	21 9 58	3767	22 25 35	3623
	Pollux E.	63 54 4	2853	62 20 45	2847	60 47 18	2841	59 13 43	2835
	Regulus E.	99 42 25	2748	98 6 49	2738	96 31 0	2729	94 54 58	2719
22	SUN W.	60 21 37	3003	61 51 46	2991	63 22 10	2980	64 52 48	2967
	α Arietis W.	29 15 37	3173	30 42 18	3116	32 10 8	3065	33 39 1	3018
	Pollux E.	51 23 58	2810	49 49 43	2806	48 15 23	2803	46 40 59	2801
	Regulus E.	86 51 24	2666	85 13 59	2655	83 36 19	2645	81 58 25	2633

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV <sup>h</sup>	P. L. of Diff.	XVIII <sup>h</sup>	P. L. of Diff.	XXI <sup>h</sup>	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
8	Spica	W.	55 25 29	2837	56 59 9	2851	58 32 31	2865	60 5 35	2877
	α Aquilæ	E.	47 6 40	3707	45 50 0	3769	44 34 26	3838	43 20 3	3910
	SATURN	E.	58 36 26	2873	57 3 33	2890	55 31 1	2904	53 58 47	2918
	VENUS	E.	59 37 0	3280	58 12 25	3296	56 48 9	3312	55 24 12	3327
	SUN	E.	90 29 12	3179	89 2 38	3194	87 36 22	3210	86 10 25	3225
9	Spica	W.	67 46 56	2937	69 18 28	2948	70 49 46	2959	72 20 50	2969
	Antares	W.	23 39 47	3307	25 3 50	3377	26 28 29	3253	27 53 36	3234
	SATURN	E.	46 22 2	2985	44 51 31	2998	43 21 15	3010	41 51 15	3022
	VENUS	E.	48 28 44	3400	47 6 27	3412	45 44 24	3425	44 22 36	3438
	SUN	E.	79 4 48	3292	77 40 27	3304	76 16 20	3315	74 52 26	3327
10	Spica	W.	79 53 14	3014	81 23 10	3021	82 52 57	3028	84 22 35	3035
	Antares	W.	35 3 28	3183	36 29 58	3178	37 56 33	3175	39 23 12	3172
	SATURN	E.	34 24 50	3079	32 56 15	3090	31 27 53	3101	29 59 44	3112
	VENUS	E.	37 36 55	3494	36 16 24	3504	34 56 4	3514	33 35 55	3524
	SUN	E.	67 56 1	3376	66 33 17	3384	65 10 42	3392	63 48 16	3400
11	Spica	W.	91 48 49	3063	93 17 44	3068	94 46 33	3072	96 15 17	3076
	Antares	W.	46 37 8	3164	48 4 0	3164	49 30 52	3163	50 57 45	3163
	VENUS	E.	26 57 49	3571	25 38 43	3580	24 19 47	3590	23 1 2	3601
	SUN	E.	56 58 4	3431	55 36 22	3435	54 14 45	3439	52 53 13	3444
12	Antares	W.	58 12 20	3160	59 39 17	3158	61 6 16	3158	62 33 15	3157
	SUN	E.	46 6 33	3457	44 45 21	3460	43 24 12	3461	42 3 4	3462
13	Antares	W.	69 48 37	3149	71 15 47	3147	72 43 0	3145	74 10 15	3143
	SUN	E.	35 17 34	3462	33 56 27	3461	32 35 19	3460	31 14 10	3459
14	Antares	W.	81 27 16	3129	82 54 50	3126	84 22 28	3123	85 50 10	3119
	SUN	E.	24 27 54	3447	23 6 30	3444	21 45 3	3441	20 23 33	3438
19	SUN	W.	31 4 9	3205	32 30 12	3196	33 56 26	3188	35 22 50	3178
	Aldebaran	E.	38 30 39	2846	36 57 11	2838	35 23 33	2831	33 49 45	2822
	Pollux	E.	82 22 35	2935	80 51 1	2929	79 19 19	2922	77 47 28	2914
20	SUN	W.	42 37 33	3132	44 5 4	3122	45 32 47	3112	47 0 42	3102
	Aldebaran	E.	25 58 1	2779	24 23 6	2771	22 48 0	2762	21 12 42	2753
	Pollux	E.	70 5 56	2880	68 33 11	2873	67 0 17	2866	65 27 15	2859
21	SUN	W.	54 23 25	3049	55 52 37	3038	57 22 3	3026	58 51 43	3015
	α Arietis	W.	23 43 44	3503	25 4 5	3401	26 26 20	3314	27 50 15	3240
	Pollux	E.	57 40 0	2829	56 6 10	2823	54 32 12	2818	52 58 8	2814
	Regulus	E.	93 18 43	2708	91 42 14	2698	90 5 32	2687	88 28 35	2677
22	SUN	W.	66 23 42	2954	67 54 52	2943	69 26 17	2930	70 57 58	2916
	α Arietis	W.	35 8 51	2976	36 39 34	2938	38 11 5	2902	39 43 21	2870
	Pollux	E.	45 6 32	2800	43 32 4	2799	41 57 35	2801	40 23 9	2804
	Regulus	E.	80 20 15	2621	78 41 49	2610	77 3 8	2599	75 24 11	2587

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
23	SUN	W.	72 29 56	2904	74 2 10	2891	75 34 41	2877	77 7 29	2864
	α Arietis	W.	41 16 19	2839	42 49 56	2810	44 24 11	2784	45 59 0	2758
	Pollux	E.	38 48 46	2808	37 14 29	2815	35 40 21	2825	34 6 25	2838
	Regulus	E.	73 44 58	2575	72 5 29	2563	70 25 43	2551	68 45 40	2539
24	SUN	W.	84 55 52	2795	86 30 26	2781	88 5 19	2767	89 40 30	2752
	α Arietis	W.	54 1 5	2646	55 38 58	2625	57 17 19	2606	58 56 6	2588
	Aldebaran	W.	19 48 16	2469	21 30 13	2455	23 12 29	2443	24 55 3	2429
	Pollux	E.	26 23 1	2986	24 52 31	3044	23 23 13	3119	21 55 26	3215
	Regulus	E.	60 21 9	2475	58 39 21	2463	56 57 16	2450	55 14 53	2438
25	SUN	W.	97 41 10	2681	99 18 15	2667	100 55 39	2652	102 33 23	2639
	α Arietis	W.	67 16 18	2499	68 57 33	2482	70 39 11	2467	72 21 11	2450
	Aldebaran	W.	33 32 39	2362	35 17 8	2349	37 1 56	2337	38 47 2	2323
	Regulus	E.	46 38 25	2373	44 54 12	2362	43 9 42	2349	41 24 54	2337
	Spica	E.	100 8 15	2375	98 24 4	2361	96 39 33	2348	94 54 43	2335
26	SUN	W.	110 46 45	2569	112 26 22	2556	114 6 17	2543	115 46 30	2530
	α Arietis	W.	80 56 35	2378	82 40 41	2364	84 25 7	2352	86 9 51	2340
	Aldebaran	W.	47 37 23	2259	49 24 23	2246	51 11 42	2234	52 59 19	2223
	Regulus	E.	32 36 36	2280	30 50 7	2271	29 3 25	2261	27 16 28	2252
	Spica	E.	86 5 50	2270	84 19 7	2258	82 32 6	2246	80 44 47	2235
27	SUN	W.	124 11 56	2471	125 53 50	2460	127 36 0	2449	129 18 25	2438
	Aldebaran	W.	62 1 45	2166	63 51 4	2156	65 40 38	2146	67 30 27	2136
	Pollux	W.	21 31 8	2868	23 4 8	2760	24 39 29	2671	26 16 48	2598
	Spica	E.	71 43 57	2179	69 54 58	2169	68 5 44	2161	66 16 17	2151
28	Aldebaran	W.	76 42 58	2095	78 34 5	2088	80 25 22	2083	82 16 48	2077
	Pollux	W.	34 44 2	2366	36 28 26	2336	38 13 33	2311	39 59 17	2288
	Spica	E.	57 5 44	2113	55 15 4	2107	53 24 15	2102	51 33 18	2097
	Antares	E.	102 46 36	2159	100 57 6	2151	99 7 24	2144	97 17 32	2138
29	Aldebaran	W.	91 35 54	2057	93 27 59	2055	95 20 8	2053	97 12 19	2052
	Pollux	W.	48 55 6	2210	50 43 19	2200	52 31 47	2191	54 20 28	2184
	Spica	E.	42 17 8	2085	40 25 45	2085	38 34 22	2086	36 43 1	2088
	Antares	E.	88 6 13	2118	86 15 41	2116	84 25 6	2115	82 34 29	2115
30	Pollux	W.	63 25 55	2167	65 15 12	2167	67 4 29	2168	68 53 45	2170
	Regulus	W.	26 36 29	2087	28 27 49	2087	30 19 8	2088	32 10 25	2090
	Spica	E.	27 27 46	2120	25 37 17	2132	23 47 6	2147	21 57 19	2166
	Antares	E.	73 21 44	2125	71 31 23	2130	69 41 10	2136	67 51 5	2142
31	Pollux	W.	77 58 49	2194	79 47 25	2202	81 35 50	2210	83 24 3	2219
	Regulus	W.	41 25 29	2117	43 16 3	2124	45 6 26	2132	46 56 36	2141
	Antares	E.	58 43 34	2188	56 54 48	2200	55 6 21	2213	53 18 13	2228
	α Aquilæ	E.	107 11 27	2565	105 31 44	2565	103 52 1	2567	102 12 21	2571



## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
23	SUN	W.	78 40 34	2850	80 13 57	2837	81 47 37	2822	83 21 36	2809
	α Arietis	W.	47 34 23	2734	49 10 18	2711	50 46 44	2688	52 23 40	2666
	Pollux	E.	32 32 47	2855	30 59 30	2877	29 26 41	2905	27 54 28	2941
	Regulus	E.	67 5 21	2526	65 24 44	2514	63 43 50	2501	62 2 38	2489
24	SUN	W.	91 16 1	2738	92 51 50	2725	94 27 57	2710	96 4 24	2696
	α Arietis	W.	60 35 18	2568	62 14 57	2551	63 55 0	2533	65 35 27	2516
	Aldebaran	W.	26 37 56	2415	28 21 9	2403	30 4 40	2389	31 48 30	2376
	Pollux	E.	20 29 34	3339	19 6 8	3504	17 45 48	3723	16 29 25	4018
	Regulus	E.	53 32 12	2425	51 49 13	2412	50 5 55	2399	48 22 19	2387
25	SUN	W.	104 11 25	2624	105 49 47	2610	107 28 28	2597	109 7 27	2583
	α Arietis	W.	74 3 34	2436	75 46 18	2421	77 29 23	2406	79 12 49	2392
	Aldebaran	W.	40 32 28	2309	42 18 14	2297	44 4 18	2284	45 50 41	2271
	Regulus	E.	39 39 48	2325	37 54 25	2313	36 8 45	2302	34 22 49	2291
	Spica	E.	93 9 34	2322	91 24 6	2309	89 38 20	2296	87 52 14	2283
26	SUN	W.	117 27 1	2518	119 7 49	2505	120 48 55	2494	122 30 17	2482
	α Arietis	W.	87 54 53	2327	89 40 13	2316	91 25 49	2304	93 11 42	2294
	Aldebaran	W.	54 47 13	2210	56 35 26	2199	58 23 55	2187	60 12 42	2177
	Regulus	E.	25 29 18	2245	23 41 58	2239	21 54 29	2235	20 6 53	2233
	Spica	E.	78 57 11	2223	77 9 17	2212	75 21 7	2200	73 32 40	2190
27	SUN	W.	131 1 5	2429	132 43 58	2420	134 27 4	2411	136 10 23	2403
	Aldebaran	W.	69 20 31	2127	71 10 49	2118	73 1 20	2111	74 52 3	2103
	Pollux	W.	27 55 46	2535	29 36 10	2483	31 17 47	2438	33 0 27	2400
	Spica	E.	64 26 35	2142	62 36 40	2134	60 46 33	2126	58 56 14	2119
28	Aldebaran	W.	84 8 23	2072	86 0 6	2067	87 51 56	2063	89 43 52	2059
	Pollux	W.	41 45 34	2268	43 32 21	2250	45 19 34	2235	47 7 10	2221
	Spica	E.	49 42 14	2093	47 51 4	2090	45 59 49	2087	44 8 30	2085
	Antares	E.	95 27 31	2133	93 37 22	2128	91 47 5	2123	89 56 41	2120
29	Aldebaran	W.	99 4 32	2053	100 56 44	2053	102 48 56	2054	104 41 6	2056
	Pollux	W.	56 9 20	2179	57 58 20	2174	59 47 27	2171	61 36 39	2168
	Spica	E.	34 51 44	2091	33 0 31	2096	31 9 26	2102	29 18 30	2110
	Antares	E.	80 43 52	2115	78 53 16	2117	77 2 42	2118	75 12 11	2121
30	Pollux	W.	70 42 58	2173	72 32 6	2177	74 21 8	2182	76 10 2	2187
	Regulus	W.	34 1 39	2094	35 52 48	2098	37 43 50	2103	39 34 44	2109
	Spica	E.	20 8 0	2189	18 19 16	2221	16 31 19	2261	14 44 22	2317
	Antares	E.	66 1 10	2149	64 11 25	2158	62 21 54	2167	60 32 36	2177
31	Pollux	W.	85 12 2	2229	86 59 47	2240	88 47 15	2251	90 34 27	2263
	Regulus	W.	48 46 32	2151	50 36 13	2161	52 25 39	2173	54 14 48	2184
	Antares	E.	51 30 27	2243	49 43 4	2260	47 56 5	2277	46 9 32	2297
	α Aquilæ	E.	100 32 46	2575	98 53 17	2583	97 13 58	2591	95 34 50	2600

## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S						Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.	Subtracted from Apparent Time.			
		h m s	s	° ' "	"	' "	s	m s	s	
Frid.	1	0 41 41.62	9.097	N. 4 29 13.7	+ 57.85	16 1.81	64.47	4 1.28	0.758	
Sat.	2	0 45 19.99	9.101	4 52 19.8	57.64	16 1.53	64.49	3 43.14	0.753	
SUN.	3	0 48 58.49	9.107	5 15 20.7	57.42	16 1.25	64.51	3 25.15	0.747	
Mon.	4	0 52 37.15	9.115	5 38 16.2	+ 57.19	16 0.97	64.53	3 7.30	0.740	
Tues.	5	0 56 15.99	9.123	6 1 5.8	56.94	16 0.69	64.56	2 49.64	0.732	
Wed.	6	0 59 55.03	9.131	6 23 49.2	56.67	16 0.40	64.59	2 32.17	0.724	
Thur.	7	1 3 34.28	9.140	6 46 26.2	+ 56.39	16 0.12	64.62	2 14.91	0.714	
Frid.	8	1 7 13.76	9.150	7 8 56.3	56.10	15 59.84	64.65	1 57.90	0.704	
Sat.	9	1 10 53.50	9.161	7 31 19.2	55.80	15 59.56	64.69	1 41.13	0.693	
SUN.	10	1 14 33.51	9.173	7 53 34.6	+ 55.48	15 59.28	64.73	1 24.64	0.682	
Mon.	11	1 18 13.80	9.185	8 15 42.1	55.14	15 59.01	64.77	1 8.42	0.670	
Tues.	12	1 21 54.39	9.198	8 37 41.4	54.79	15 58.73	64.82	0 52.49	0.657	
Wed.	13	1 25 35.29	9.211	8 59 32.2	+ 54.43	15 58.46	64.86	0 36.88	0.643	
Thur.	14	1 29 16.52	9.225	9 21 14.0	54.05	15 58.18	64.91	0 21.61	0.629	
Frid.	15	1 32 58.09	9.240	9 42 46.5	53.66	15 57.91	64.96	0 6.66	0.615	
Sat.	16	1 36 40.01	9.255	10 4 9.5	+ 53.25	15 57.64	65.01	0 7.93	0.600	
SUN.	17	1 40 22.30	9.270	10 25 22.4	52.83	15 57.38	65.06	0 22.16	0.585	
Mon.	18	1 44 4.96	9.286	10 46 25.1	52.39	15 57.12	65.12	0 36.00	0.569	
Tues.	19	1 47 48.01	9.302	11 7 17.1	+ 51.94	15 56.86	65.18	0 49.48	0.553	
Wed.	20	1 51 31.45	9.319	11 27 58.1	51.47	15 56.61	65.24	1 2.55	0.536	
Thur.	21	1 55 15.30	9.336	11 48 27.7	50.99	15 56.35	65.30	1 15.22	0.519	
Frid.	22	1 58 59.56	9.353	12 8 45.7	+ 50.50	15 56.10	65.37	1 27.48	0.502	
Sat.	23	2 2 44.26	9.371	12 28 51.6	49.99	15 55.85	65.43	1 39.31	0.484	
SUN.	24	2 6 29.39	9.390	12 48 45.1	49.47	15 55.61	65.50	1 50.70	0.465	
Mon.	25	2 10 14.97	9.409	13 8 26.0	+ 48.93	15 55.36	65.57	2 1.64	0.446	
Tues.	26	2 14 1.03	9.429	13 27 53.8	48.38	15 55.11	65.64	2 12.11	0.426	
Wed.	27	2 17 47.55	9.449	13 47 8.4	47.82	15 54.87	65.71	2 22.10	0.406	
Thur.	28	2 21 34.58	9.470	14 6 9.3	+ 47.25	15 54.63	65.79	2 31.61	0.385	
Frid.	29	2 25 22.10	9.491	14 24 56.2	46.66	15 54.38	65.86	2 40.61	0.364	
Sat.	30	2 29 10.14	9.513	14 43 29.0	46.06	15 54.14	65.94	2 49.10	0.342	
SUN.	31	2 32 58.72	9.536	N. 15 1 47.1	+ 45.45	15 53.90	66.02	2 57.04	0.320	

NOTE.—The mean time of semidiameter passing the meridian may be found by subtracting 0.18\* from the sidereal time.  
The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

## AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Equation of Time, to be Subtracted from		Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Added to Mean Time.				
						m	s			
Frid.	1	h m s 0 41 41.00	s, 9.098	N. ° ' " 4 29 9.8	" + 57.87	m s 4 1.33	s 0.758	h m s 0 37 39.68		
Sat.	2	0 45 19.42	9.103	4 52 16.2	57.66	3 43.19	0.753	0 41 36.23		
SUN.	3	0 48 57.97	9.109	5 15 17.5	57.44	3 25.19	0.747	0 45 32.78		
Mon.	4	0 52 36.68	9.116	5 38 13.2	+ 57.20	3 7.34	0.740	0 49 29.33		
Tues.	5	0 56 15.56	9.124	6 1 3.1	56.95	2 49.67	0.732	0 53 25.89		
Wed.	6	0 59 54.64	9.133	6 23 46.8	56.69	2 32.20	0.724	0 57 22.44		
Thur.	7	1 3 33.94	9.142	6 46 24.1	+ 56.41	2 14.94	0.714	1 1 18.99		
Frid.	8	1 7 13.46	9.152	7 8 54.5	56.12	1 57.92	0.704	1 5 15.54		
Sat.	9	1 10 53.25	9.163	7 31 17.7	55.81	1 41.15	0.693	1 9 12.10		
SUN.	10	1 14 33.29	9.174	7 53 33.3	+ 55.49	1 24.65	0.682	1 13 8.65		
Mon.	11	1 18 13.62	9.186	8 15 41.1	55.16	1 8.43	0.670	1 17 5.20		
Tues.	12	1 21 54.25	9.199	8 37 40.6	54.81	0 52.50	0.657	1 21 1.75		
Wed.	13	1 25 35.20	9.213	8 59 31.6	+ 54.44	0 36.89	0.644	1 24 58.30		
Thur.	14	1 29 16.46	9.227	9 21 13.7	54.06	0 21.61	0.630	1 28 54.86		
Frid.	15	1 32 58.08	9.241	9 42 46.4	53.67	0 6.66	0.615	1 32 51.41		
Sat.	16	1 36 40.04	9.256	10 4 9.6	+ 53.26	0 7.93	0.600	1 36 47.96		
SUN.	17	1 40 22.36	9.271	10 25 22.8	52.84	0 22.16	0.585	1 40 44.52		
Mon.	18	1 44 5.06	9.287	10 46 25.6	52.40	0 36.01	0.570	1 44 41.07		
Tues.	19	1 47 48.14	9.303	11 7 17.8	+ 51.95	0 49.49	0.554	1 48 37.62		
Wed.	20	1 51 31.61	9.320	11 27 59.0	51.48	1 2.56	0.537	1 52 34.17		
Thur.	21	1 55 15.49	9.337	11 48 28.8	51.00	1 15.23	0.520	1 56 30.73		
Frid.	22	1 58 59.79	9.355	12 8 46.9	+ 50.50	1 27.49	0.502	2 0 27.28		
Sat.	23	2 2 44.52	9.373	12 28 53.0	50.00	1 39.32	0.484	2 4 23.83		
SUN.	24	2 6 29.68	9.391	12 48 46.6	49.48	1 50.71	0.465	2 8 20.39		
Mon.	25	2 10 15.29	9.410	13 8 27.6	+ 48.94	2 1.65	0.446	2 12 16.94		
Tues.	26	2 14 1.37	9.430	13 27 55.6	48.39	2 12.12	0.427	2 16 13.49		
Wed.	27	2 17 47.93	9.450	13 47 10.3	47.83	2 22.12	0.407	2 20 10.05		
Thur.	28	2 21 34.97	9.471	14 6 11.3	+ 47.25	2 31.63	0.386	2 24 6.60		
Frid.	29	2 25 22.52	9.492	14 24 58.3	46.67	2 40.63	0.365	2 28 3.15		
Sat.	30	2 29 10.59	9.514	14 43 31.1	46.07	2 49.12	0.343	2 31 59.71		
SUN.	31	2 32 59.19	9.536	N. 15 1 49.4	+ 45.46	2 57.06	0.320	2 35 56.26		

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.  
The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

Diff. for 1 Hour,  
+9' 8565.  
(Table III.)

AT GREENWICH MEAN NOON.								
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		$\lambda$	$\lambda'$					
1	92	11 20 28.7	20 17.5	147.85	— 0.09	9.999 8609	+ 52.5	<sup>h</sup> 23 <sup>m</sup> 18 <sup>s</sup> 30.58
2	93	12 19 36.2	19 24.9	147.77	+ 0.02	9.999 9871	52.7	23 14 34.68
3	94	13 18 41.7	18 30.4	147.69	0.12	0.000 1138	52.9	23 10 38.77
4	95	14 17 45.4	17 34.0	147.62	+ 0.19	0.000 2409	+ 53.0	23 6 42.86
5	96	15 16 47.3	16 35.8	147.54	0.23	0.000 3682	53.0	23 2 46.96
6	97	16 15 47.5	15 35.9	147.47	0.24	0.000 4955	53.0	22 58 51.05
7	98	17 14 45.9	14 34.2	147.40	+ 0.22	0.000 6228	+ 53.0	22 54 55.15
8	99	18 13 42.5	13 30.7	147.32	0.17	0.000 7498	52.9	22 50 59.24
9	100	19 12 37.4	12 25.5	147.25	+ 0.10	0.000 8765	52.7	22 47 3.33
10	101	20 11 30.4	11 18.4	147.17	0.00	0.001 0027	+ 52.5	22 43 7.43
11	102	21 10 21.7	10 9.7	147.10	— 0.11	0.001 1283	52.2	22 39 11.52
12	103	22 9 11.2	8 59.1	147.02	0.23	0.001 2531	51.8	22 35 15.61
13	104	23 7 58.9	7 46.7	146.95	— 0.35	0.001 3770	+ 51.4	22 31 19.71
14	105	24 6 44.7	6 32.4	146.87	0.49	0.001 5000	51.0	22 27 23.80
15	106	25 5 28.6	5 16.2	146.79	0.61	0.001 6220	50.6	22 23 27.89
16	107	26 4 10.6	3 58.0	146.71	— 0.72	0.001 7428	+ 50.1	22 19 31.99
17	108	27 2 50.6	2 37.9	146.62	0.82	0.001 8626	49.6	22 15 36.08
18	109	28 1 28.5	1 15.8	146.54	0.89	0.001 9811	49.1	22 11 40.17
19	110	28 60 4.3	59 51.5	146.45	— 0.94	0.002 0985	+ 48.7	22 7 44.27
20	111	29 58 38.0	58 25.1	146.36	0.95	0.002 2148	48.2	22 3 48.36
21	112	30 57 9.6	56 56.6	146.27	0.93	0.002 3300	47.8	21 59 52.45
22	113	31 55 39.0	55 25.9	146.18	— 0.89	0.002 4442	+ 47.4	21 55 56.54
23	114	32 54 6.2	53 53.0	146.09	0.81	0.002 5576	47.1	21 52 0.64
24	115	33 52 31.2	52 17.9	146.00	0.70	0.002 6702	46.8	21 48 4.73
25	116	34 50 54.1	50 40.7	145.91	— 0.58	0.002 7822	+ 46.5	21 44 8.82
26	117	35 49 14.8	49 1.3	145.82	0.44	0.002 8936	46.3	21 40 12.91
27	118	36 47 33.5	47 19.9	145.74	0.30	0.003 0046	46.2	21 36 17.00
28	119	37 45 50.2	45 36.5	145.66	— 0.17	0.003 1153	+ 46.0	21 32 21.10
29	120	38 44 5.0	43 51.2	145.58	— 0.05	0.003 2256	45.9	21 28 25.19
30	121	39 42 18.0	42 4.1	145.51	+ 0.06	0.003 3355	45.7	21 24 29.28
31	122	40 40 29.3	40 15.2	145.44	+ 0.13	0.003 4450	+ 45.5	21 20 33.37

NOTE.—The longitudes in the column  $\lambda$  are referred to the true equinox of their own date, while those in the column  $\lambda'$  are referred to the mean equinox of the beginning of the Besselian fictitious year.

Diff. for 1 Hour.  
— 9<sup>s</sup>.8296.  
(Table II.)

## GREENWICH MEAN TIME.

## THE MOON'S

Day of the Month.	THE MOON'S									
	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.	
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.	
	"	"	"	"	"	"	h m	m	d	
1	16 20.0	16 14.1	59 50.7	- 1.66	59 29.3	- 1.88	13 26.0	2.25	15.3	
2	16 7.6	16 0.7	59 5.4	2.05	58 39.9	2.18	14 19.8	2.23	16.3	
3	15 53.4	15 46.0	58 13.2	2.25	57 45.9	2.27	15 13.2	2.21	17.3	
4	15 38.6	15 31.4	57 18.7	- 2.24	56 52.2	- 2.17	16 5.8	2.17	18.3	
5	15 24.4	15 17.9	56 26.7	2.07	56 2.6	1.93	16 57.2	2.11	19.3	
6	15 11.8	15 6.3	55 40.4	1.76	55 20.2	1.58	17 47.1	2.04	20.3	
7	15 1.4	14 57.2	55 2.3	- 1.39	54 46.8	- 1.18	18 35.3	1.97	21.3	
8	14 53.7	14 50.8	54 33.9	0.98	54 23.4	0.76	19 21.8	1.90	22.3	
9	14 48.7	14 47.2	54 15.5	0.55	54 10.1	- 0.35	20 6.8	1.85	23.3	
10	14 46.4	14 46.2	54 7.1	- 0.15	54 6.4	+ 0.03	20 50.7	1.81	24.3	
11	14 46.6	14 47.6	54 8.0	+ 0.21	54 11.5	0.38	21 33.9	1.79	25.3	
12	14 49.1	14 51.1	54 17.0	0.53	54 24.2	0.66	22 16.9	1.80	26.3	
13	14 53.4	14 56.2	54 32.9	+ 0.78	54 43.0	+ 0.89	23 0.4	1.83	27.3	
14	14 59.2	15 2.6	54 54.2	0.98	55 6.4	1.05	23 45.0	1.89	28.3	
15	15 6.1	15 9.8	55 19.4	1.10	55 33.0	1.15	0 31.1	1.96	29.3	
16	15 13.6	15 17.6	55 47.1	+ 1.19	56 1.5	+ 1.21	1 19.2	2.05	0.6	
17	15 21.6	15 25.6	56 16.2	1.23	56 31.0	1.24	2 9.5	2.14	1.6	
18	15 29.7	15 33.7	56 46.0	1.24	57 0.9	1.24	3 2.0	2.23	2.6	
19	15 37.8	15 41.8	57 15.8	+ 1.24	57 30.7	+ 1.23	3 56.3	2.29	3.6	
20	15 45.8	15 49.8	57 45.4	1.23	58 0.1	1.21	4 51.7	2.32	4.6	
21	15 53.8	15 57.6	58 14.5	1.19	58 28.6	1.16	5 47.5	2.32	5.6	
22	16 1.4	16 5.0	58 42.4	+ 1.12	58 55.6	+ 1.07	6 43.0	2.30	6.6	
23	16 8.4	16 11.5	59 8.1	1.00	59 19.7	0.91	7 37.7	2.27	7.6	
24	16 14.3	16 16.7	59 30.0	0.80	59 38.9	0.66	8 31.7	2.23	8.6	
25	16 18.7	16 20.1	59 46.0	+ 0.50	59 51.1	+ 0.32	9 25.0	2.22	9.6	
26	16 20.8	16 20.8	59 53.8	+ 0.12	59 53.9	- 0.10	10 18.2	2.22	10.6	
27	16 20.1	16 18.6	59 51.2	- 0.34	59 45.7	0.58	11 11.4	2.23	11.6	
28	16 16.3	16 13.2	59 37.2	- 0.83	59 25.9	- 1.06	12 5.0	2.24	12.6	
29	16 9.4	16 4.9	59 11.8	1.28	58 55.3	1.47	12 58.8	2.24	13.6	
30	15 59.8	15 54.2	58 36.6	1.63	58 16.1	1.76	13 52.5	2.23	14.6	
31	15 48.2	15 42.1	57 54.2	1.85	57 31.5	1.91	14 45.6	2.19	15.6	
32	15 35.8	15 29.5	57 8.4	- 1.92	56 45.3	- 1.90			16.6	

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 1.					SUNDAY 3.				
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	13 34 30.66	2.3374	S. 7 16 39.8	10.434	0	15 26 9.20	2.3111	S. 14 16 39.5	6.762
1	13 36 50.89	2.3369	7 27 4.2	10.379	1	15 28 27.84	2.3102	14 23 22.4	6.669
2	13 39 11.09	2.3365	7 37 25.3	10.323	2	15 30 46.43	2.3093	14 29 59.8	6.576
3	13 41 31.27	2.3361	7 47 43.0	10.266	3	15 33 4.96	2.3084	14 36 31.5	6.481
4	13 43 51.42	2.3357	7 57 57.2	10.207	4	15 35 23.44	2.3075	14 42 57.5	6.387
5	13 46 11.55	2.3353	8 8 7.8	10.147	5	15 37 41.86	2.3066	14 49 18.0	6.293
6	13 48 31.65	2.3348	8 18 14.8	10.086	6	15 40 0.23	2.3057	14 55 32.7	6.198
7	13 50 51.72	2.3343	8 28 18.1	10.024	7	15 42 18.54	2.3047	15 1 41.7	6.103
8	13 53 11.77	2.3339	8 38 17.7	9.961	8	15 44 36.79	2.3037	15 7 45.0	6.008
9	13 55 31.79	2.3335	8 48 13.4	9.897	9	15 46 54.98	2.3026	15 13 42.6	5.912
10	13 57 51.79	2.3332	8 58 5.3	9.833	10	15 49 13.10	2.3015	15 19 34.4	5.815
11	14 0 11.77	2.3328	9 7 53.3	9.767	11	15 51 31.16	2.3005	15 25 20.4	5.718
12	14 2 31.72	2.3323	9 17 37.3	9.699	12	15 53 49.16	2.2994	15 31 0.6	5.622
13	14 4 51.64	2.3318	9 27 17.2	9.632	13	15 56 7.09	2.2983	15 36 35.0	5.524
14	14 7 11.54	2.3314	9 36 53.1	9.563	14	15 58 24.95	2.2971	15 42 3.5	5.427
15	14 9 31.41	2.3309	9 46 24.8	9.493	15	16 0 42.74	2.2959	15 47 26.2	5.330
16	14 11 51.25	2.3304	9 55 52.3	9.423	16	16 3 0.46	2.2948	15 52 43.1	5.232
17	14 14 11.06	2.3300	10 5 15.5	9.351	17	16 5 18.11	2.2936	15 57 54.0	5.133
18	14 16 30.85	2.3296	10 14 34.4	9.278	18	16 7 35.69	2.2923	16 2 59.1	5.036
19	14 18 50.61	2.3292	10 23 48.9	9.205	19	16 9 53.19	2.2910	16 7 58.3	4.938
20	14 21 10.35	2.3287	10 32 59.0	9.132	20	16 12 10.61	2.2897	16 12 51.6	4.839
21	14 23 30.05	2.3282	10 42 4.7	9.057	21	16 14 27.95	2.2884	16 17 39.0	4.740
22	14 25 49.73	2.3277	10 51 5.8	8.980	22	16 16 45.22	2.2871	16 22 20.4	4.641
23	14 28 9.37	2.3272	S. 11 0 2.3	8.903	23	16 19 2.40	2.2857	S. 16 26 55.9	4.542
SATURDAY 2.					MONDAY 4.				
0	14 30 28.99	2.3268	S. 11 8 54.2	8.826	0	16 21 19.50	2.2843	S. 16 31 25.5	4.443
1	14 32 48.58	2.3263	11 17 41.4	8.748	1	16 23 36.51	2.2828	16 35 49.1	4.343
2	14 35 8.14	2.3257	11 26 23.9	8.668	2	16 25 53.44	2.2814	16 40 6.7	4.244
3	14 37 27.66	2.3252	11 35 1.6	8.588	3	16 28 10.28	2.2800	16 44 18.4	4.146
4	14 39 47.16	2.3247	11 43 34.5	8.507	4	16 30 27.04	2.2785	16 48 24.2	4.046
5	14 42 6.62	2.3241	11 52 2.5	8.426	5	16 32 43.70	2.2768	16 52 23.9	3.946
6	14 44 26.05	2.3236	12 0 25.6	8.344	6	16 35 0.26	2.2753	16 56 17.7	3.847
7	14 46 45.45	2.3230	12 8 43.8	8.262	7	16 37 16.74	2.2738	17 0 5.5	3.747
8	14 49 4.81	2.3223	12 16 57.0	8.178	8	16 39 33.12	2.2722	17 3 47.3	3.647
9	14 51 24.13	2.3218	12 25 5.2	8.094	9	16 41 49.40	2.2706	17 7 23.1	3.548
10	14 53 43.42	2.3212	12 33 8.3	8.009	10	16 44 5.59	2.2689	17 10 53.0	3.448
11	14 56 2.67	2.3206	12 41 6.3	7.924	11	16 46 21.67	2.2672	17 14 16.9	3.348
12	14 58 21.89	2.3200	12 48 59.2	7.838	12	16 48 37.65	2.2655	17 17 34.8	3.248
13	15 0 41.07	2.3193	12 56 46.9	7.751	13	16 50 53.53	2.2638	17 20 46.7	3.149
14	15 3 0.21	2.3187	13 4 29.3	7.663	14	16 53 9.30	2.2620	17 23 52.7	3.050
15	15 5 19.31	2.3179	13 12 6.5	7.576	15	16 55 24.97	2.2602	17 26 52.7	2.950
16	15 7 38.36	2.3172	13 19 38.4	7.488	16	16 57 40.53	2.2584	17 29 46.7	2.851
17	15 9 57.37	2.3165	13 27 5.0	7.398	17	16 59 55.98	2.2566	17 32 34.8	2.751
18	15 12 16.34	2.3158	13 34 26.2	7.309	18	17 2 11.32	2.2547	17 35 16.8	2.651
19	15 14 35.27	2.3151	13 41 42.1	7.219	19	17 4 26.54	2.2528	17 37 52.9	2.552
20	15 16 54.15	2.3143	13 48 52.5	7.128	20	17 6 41.65	2.2509	17 40 23.1	2.453
21	15 19 12.99	2.3135	13 55 57.5	7.038	21	17 8 56.65	2.2490	17 42 47.3	2.354
22	15 21 31.77	2.3127	14 2 57.0	6.946	22	17 11 11.53	2.2470	17 45 5.6	2.256
23	15 23 50.51	2.3119	14 9 51.0	6.854	23	17 13 26.29	2.2450	17 47 18.0	2.157
24	15 26 9.20	2.3111	S. 14 16 39.5	6.762	24	17 15 40.93	2.2430	S. 17 49 24.4	2.058

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 5.					THURSDAY 7.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	17 15 40.93	2.2430	S. 17 49 24.4	2.058	0	19 0 38.87	2.1248	S. 17 39 11.2	2.360
1	17 17 55.45	2.2410	17 51 24.9	1.959	1	19 2 46.27	2.1220	17 36 47.1	2.443
2	17 20 9.85	2.2389	17 53 19.5	1.862	2	19 4 53.51	2.1192	17 34 18.0	2.527
3	17 22 24.12	2.2368	17 55 8.3	1.763	3	19 7 0.58	2.1164	17 31 43.9	2.609
4	17 24 38.27	2.2347	17 56 51.1	1.665	4	19 9 7.48	2.1137	17 29 4.9	2.690
5	17 26 52.29	2.2326	17 58 28.1	1.568	5	19 11 14.22	2.1110	17 26 21.1	2.772
6	17 29 6.18	2.2305	17 59 59.2	1.469	6	19 13 20.80	2.1083	17 23 32.3	2.853
7	17 31 19.95	2.2283	18 1 24.4	1.372	7	19 15 27.21	2.1055	17 20 38.7	2.933
8	17 33 33.58	2.2261	18 2 43.8	1.275	8	19 17 33.46	2.1027	17 17 40.3	3.013
9	17 35 47.08	2.2238	18 3 57.4	1.178	9	19 19 39.54	2.0999	17 14 37.1	3.093
10	17 38 0.44	2.2216	18 5 5.2	1.082	10	19 21 45.45	2.0972	17 11 29.2	3.172
11	17 40 13.67	2.2194	18 6 7.2	0.985	11	19 23 51.20	2.0945	17 8 16.5	3.251
12	17 42 26.77	2.2172	18 7 3.4	0.889	12	19 25 56.79	2.0918	17 4 59.1	3.329
13	17 44 39.73	2.2148	18 7 53.9	0.793	13	19 28 2.21	2.0890	17 1 37.0	3.407
14	17 46 52.55	2.2125	18 8 38.6	0.697	14	19 30 7.47	2.0863	16 58 10.3	3.484
15	17 49 5.23	2.2102	18 9 17.5	0.602	15	19 32 12.56	2.0835	16 54 38.9	3.562
16	17 51 17.77	2.2077	18 9 50.8	0.507	16	19 34 17.49	2.0808	16 51 2.9	3.638
17	17 53 30.16	2.2054	18 10 18.3	0.412	17	19 36 22.26	2.0782	16 47 22.4	3.713
18	17 55 42.42	2.2031	18 10 40.2	0.318	18	19 38 26.87	2.0754	16 43 37.3	3.789
19	17 57 54.53	2.2006	18 10 56.4	0.223	19	19 40 31.31	2.0727	16 39 47.7	3.864
20	18 0 6.49	2.1982	18 11 7.0	0.129	20	19 42 35.59	2.0700	16 35 53.6	3.938
21	18 2 18.31	2.1958	18 11 11.9	-0.035	21	19 44 39.71	2.0673	16 31 55.1	4.013
22	18 4 29.98	2.1933	18 11 11.2	+0.058	22	19 46 43.67	2.0646	16 27 52.1	4.087
23	18 6 41.50	2.1908	S. 18 11 5.0	0.151	23	19 48 47.46	2.0619	S. 16 23 44.7	4.160
WEDNESDAY 6.					FRIDAY 8.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	18 8 52.87	2.1883	S. 18 10 53.1	0.244	0	19 50 51.10	2.0593	S. 16 19 32.9	4.233
1	18 11 4.09	2.1858	18 10 35.7	0.337	1	19 52 54.58	2.0567	16 15 16.8	4.305
2	18 13 15.16	2.1832	18 10 12.7	0.428	2	19 54 57.90	2.0540	16 10 56.3	4.377
3	18 15 26.07	2.1806	18 9 44.3	0.520	3	19 57 1.06	2.0514	16 6 31.6	4.448
4	18 17 36.83	2.1781	18 9 10.3	0.612	4	19 59 4.07	2.0488	16 2 2.6	4.519
5	18 19 47.44	2.1756	18 8 30.9	0.703	5	20 1 6.91	2.0461	15 57 29.3	4.589
6	18 21 57.90	2.1730	18 7 46.0	0.793	6	20 3 9.60	2.0435	15 52 51.9	4.659
7	18 24 8.20	2.1703	18 6 55.7	0.883	7	20 5 12.13	2.0409	15 48 10.2	4.728
8	18 26 18.34	2.1677	18 6 0.0	0.973	8	20 7 14.51	2.0383	15 43 24.5	4.797
9	18 28 28.32	2.1651	18 4 58.9	1.063	9	20 9 16.73	2.0358	15 38 34.6	4.866
10	18 30 38.15	2.1625	18 3 52.4	1.153	10	20 11 18.80	2.0332	15 33 40.6	4.933
11	18 32 47.82	2.1598	18 2 40.6	1.242	11	20 13 20.71	2.0306	15 28 42.0	5.001
12	18 34 57.33	2.1572	18 1 23.4	1.331	12	20 15 22.47	2.0281	15 23 40.5	5.068
13	18 37 6.68	2.1545	18 0 0.9	1.418	13	20 17 24.08	2.0257	15 18 34.4	5.135
14	18 39 15.87	2.1518	17 58 33.2	1.506	14	20 19 25.55	2.0232	15 13 24.3	5.201
15	18 41 24.90	2.1492	17 57 0.2	1.593	15	20 21 26.86	2.0207	15 8 10.3	5.266
16	18 43 33.77	2.1465	17 55 22.0	1.680	16	20 23 28.03	2.0183	15 2 52.4	5.331
17	18 45 42.48	2.1438	17 53 38.6	1.767	17	20 25 29.05	2.0158	14 57 30.6	5.396
18	18 47 51.02	2.1410	17 51 50.0	1.853	18	20 27 29.92	2.0133	14 52 4.9	5.460
19	18 49 59.40	2.1383	17 49 56.3	1.938	19	20 29 30.65	2.0109	14 46 35.4	5.523
20	18 52 7.62	2.1357	17 47 57.4	2.023	20	20 31 31.23	2.0085	14 41 2.1	5.587
21	18 54 15.68	2.1329	17 45 53.5	2.108	21	20 33 31.67	2.0062	14 35 25.0	5.649
22	18 56 23.57	2.1302	17 43 44.4	2.193	22	20 35 31.97	2.0038	14 29 44.2	5.712
23	18 58 31.30	2.1275	17 41 30.3	2.277	23	20 37 32.13	2.0015	14 23 59.6	5.773
24	19 0 38.87	2.1248	S. 17 39 11.2	2.360	24	20 39 32.15	1.9992	S. 14 18 11.4	5.834

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 9.					MONDAY 11.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	20 39 32.15	1.9992	S. 14 18 11.4	5.834	0	22 13 17.66	1.9182	S. 8 36 45.3	8.205
1	20 41 32.03	1.9969	14 12 19.5	5.896	1	22 15 12.72	1.9172	8 28 31.9	8.242
2	20 43 31.78	1.9947	14 6 23.9	5.956	2	22 17 7.73	1.9163	8 20 16.2	8.279
3	20 45 31.39	1.9923	14 0 24.8	6.015	3	22 19 2.68	1.9154	8 11 58.4	8.315
4	20 47 30.86	1.9901	13 54 22.1	6.075	4	22 20 57.58	1.9146	8 3 38.4	8.352
5	20 49 30.20	1.9879	13 48 15.8	6.134	5	22 22 52.43	1.9138	7 55 16.2	8.387
6	20 51 29.41	1.9858	13 42 6.0	6.193	6	22 24 47.23	1.9130	7 46 52.0	8.421
7	20 53 28.49	1.9836	13 35 52.7	6.250	7	22 26 41.99	1.9123	7 38 25.7	8.456
8	20 55 27.44	1.9814	13 29 36.0	6.307	8	22 28 36.70	1.9115	7 29 57.3	8.490
9	20 57 26.26	1.9793	13 23 15.8	6.364	9	22 30 31.37	1.9108	7 21 26.9	8.522
10	20 59 24.96	1.9773	13 16 52.3	6.420	10	22 32 26.00	1.9102	7 12 54.7	8.554
11	21 1 23.53	1.9752	13 10 25.4	6.477	11	22 34 20.60	1.9097	7 4 20.4	8.587
12	21 3 21.98	1.9732	13 3 55.1	6.533	12	22 36 15.16	1.9091	6 55 44.2	8.619
13	21 5 20.31	1.9711	12 57 21.5	6.588	13	22 38 9.69	1.9085	6 47 6.1	8.650
14	21 7 18.51	1.9691	12 50 44.6	6.642	14	22 40 4.18	1.9080	6 38 26.2	8.681
15	21 9 16.60	1.9672	12 44 4.5	6.695	15	22 41 58.65	1.9076	6 29 44.4	8.712
16	21 11 14.57	1.9652	12 37 21.2	6.749	16	22 43 53.09	1.9072	6 21 0.8	8.741
17	21 13 12.42	1.9633	12 30 34.6	6.802	17	22 45 47.51	1.9068	6 12 15.5	8.769
18	21 15 10.16	1.9614	12 23 44.9	6.854	18	22 47 41.90	1.9064	6 3 28.5	8.798
19	21 17 7.79	1.9595	12 16 52.1	6.907	19	22 49 36.28	1.9062	5 54 39.7	8.827
20	21 19 5.30	1.9577	12 9 56.1	6.958	20	22 51 30.64	1.9058	5 45 49.3	8.854
21	21 21 2.71	1.9559	12 2 57.1	7.009	21	22 53 24.98	1.9055	5 36 57.2	8.882
22	21 23 0.01	1.9541	11 55 55.0	7.060	22	22 55 19.30	1.9053	5 28 3.5	8.908
23	21 24 57.20	1.9523	S. 11 48 49.9	7.110	23	22 57 13.62	1.9052	S. 5 19 8.2	8.934
SUNDAY 10.					TUESDAY 12.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	21 26 54.29	1.9506	S. 11 41 41.8	7.160	0	22 59 7.92	1.9050	S. 5 10 11.4	8.959
1	21 28 51.27	1.9489	11 34 30.7	7.209	1	23 1 2.22	1.9050	5 1 13.1	8.984
2	21 30 48.16	1.9473	11 27 16.7	7.258	2	23 2 56.52	1.9049	4 52 13.3	9.008
3	21 32 44.94	1.9456	11 19 59.8	7.306	3	23 4 50.81	1.9048	4 43 12.1	9.032
4	21 34 41.63	1.9440	11 12 40.0	7.353	4	23 6 45.10	1.9048	4 34 9.5	9.055
5	21 36 38.22	1.9424	11 5 17.4	7.401	5	23 8 39.39	1.9049	4 25 5.5	9.078
6	21 38 34.72	1.9408	10 57 51.9	7.447	6	23 10 33.69	1.9050	4 16 0.1	9.101
7	21 40 31.12	1.9393	10 50 23.7	7.493	7	23 12 27.99	1.9051	4 6 53.4	9.123
8	21 42 27.44	1.9379	10 42 52.7	7.540	8	23 14 22.30	1.9053	3 57 45.4	9.143
9	21 44 23.67	1.9364	10 35 18.9	7.585	9	23 16 16.63	1.9055	3 48 36.2	9.163
10	21 46 19.81	1.9349	10 27 42.5	7.629	10	23 18 10.96	1.9057	3 39 25.8	9.183
11	21 48 15.86	1.9335	10 20 3.4	7.674	11	23 20 5.31	1.9060	3 30 14.2	9.202
12	21 50 11.83	1.9322	10 12 21.6	7.719	12	23 21 59.68	1.9063	3 21 1.5	9.221
13	21 52 7.72	1.9308	10 4 37.2	7.761	13	23 23 54.07	1.9067	3 11 47.7	9.239
14	21 54 3.53	1.9295	9 56 50.3	7.803	14	23 25 48.48	1.9070	3 2 32.8	9.257
15	21 55 59.26	1.9282	9 49 0.8	7.846	15	23 27 42.91	1.9074	2 53 16.8	9.275
16	21 57 54.91	1.9269	9 41 8.8	7.888	16	23 29 37.37	1.9079	2 43 59.8	9.292
17	21 59 50.49	1.9257	9 33 14.3	7.929	17	23 31 31.86	1.9084	2 34 41.8	9.308
18	22 1 46.00	1.9246	9 25 17.3	7.970	18	23 33 26.38	1.9089	2 25 22.9	9.323
19	22 3 41.44	1.9234	9 17 17.9	8.010	19	23 35 20.93	1.9095	2 16 3.1	9.338
20	22 5 36.81	1.9223	9 9 16.1	8.050	20	23 37 15.52	1.9101	2 6 42.4	9.352
21	22 7 32.12	1.9213	9 1 11.9	8.089	21	23 39 10.14	1.9108	1 57 20.9	9.365
22	22 9 27.36	1.9202	8 53 5.4	8.128	22	23 41 4.81	1.9114	1 47 58.6	9.378
23	22 11 22.54	1.9192	8 44 56.5	8.167	23	23 42 59.51	1.9121	1 38 35.5	9.391
24	22 13 17.66	1.9182	S. 8 36 45.3	8.205	24	23 44 54.26	1.9129	S. 1 29 11.7	9.402



## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 13.					FRIDAY 15.				
0	h m s		° ' "		0	h m s		° ' "	
0	23 44 54.26	1.9129	S. 1 29 11.7	9.402	0	1 18 18.15	1.9924	N. 6 3 45.6	9.212
1	23 46 49.06	1.9137	1 19 47.2	9.413	1	1 20 17.77	1.9950	6 12 57.7	9.190
2	23 48 43.90	1.9145	1 10 22.1	9.424	2	1 22 17.55	1.9976	6 22 8.4	9.168
3	23 50 38.80	1.9154	1 0 56.3	9.435	3	1 24 17.48	2.0001	6 31 17.8	9.146
4	23 52 33.75	1.9163	0 51 29.9	9.444	4	1 26 17.56	2.0027	6 40 25.9	9.123
5	23 54 28.76	1.9173	0 42 3.0	9.453	5	1 28 17.80	2.0053	6 49 32.5	9.098
6	23 56 23.82	1.9183	0 32 35.6	9.461	6	1 30 18.20	2.0080	6 58 37.7	9.073
7	23 58 18.95	1.9193	0 23 7.7	9.469	7	1 32 18.76	2.0107	7 7 41.3	9.047
8	0 0 14.14	1.9203	0 13 39.3	9.477	8	1 34 19.48	2.0134	7 16 43.3	9.021
9	0 2 9.39	1.9214	S. 0 4 10.5	9.483	9	1 36 20.37	2.0162	7 25 43.8	8.993
10	0 4 4.71	1.9225	N. 0 5 18.6	9.488	10	1 38 21.42	2.0188	7 34 42.5	8.965
11	0 6 0.09	1.9237	0 14 48.0	9.493	11	1 40 22.63	2.0217	7 43 39.6	8.937
12	0 7 55.55	1.9249	0 24 17.7	9.498	12	1 42 24.02	2.0246	7 52 34.9	8.907
13	0 9 51.08	1.9262	0 33 47.7	9.502	13	1 44 25.58	2.0274	8 1 28.4	8.877
14	0 11 46.69	1.9275	0 43 17.9	9.504	14	1 46 27.31	2.0303	8 10 20.1	8.846
15	0 13 42.38	1.9288	0 52 48.2	9.507	15	1 48 29.21	2.0332	8 19 9.9	8.813
16	0 15 38.15	1.9302	1 2 18.8	9.510	16	1 50 31.29	2.0361	8 27 57.7	8.780
17	0 17 34.00	1.9316	1 11 49.4	9.510	17	1 52 33.54	2.0390	8 36 43.5	8.747
18	0 19 29.94	1.9330	1 21 20.0	9.511	18	1 54 35.97	2.0421	8 45 27.3	8.713
19	0 21 25.96	1.9344	1 30 50.7	9.512	19	1 56 38.59	2.0451	8 54 9.0	8.678
20	0 23 22.07	1.9359	1 40 21.4	9.511	20	1 58 41.38	2.0481	9 2 48.6	8.642
21	0 25 18.27	1.9375	1 49 52.0	9.509	21	2 0 44.36	2.0512	9 11 26.0	8.604
22	0 27 14.57	1.9392	1 59 22.5	9.507	22	2 2 47.52	2.0543	9 20 1.1	8.567
23	0 29 10.97	1.9408	N. 2 8 52.8	9.504	23	2 4 50.87	2.0573	N. 9 28 34.0	8.528
THURSDAY 14.					SATURDAY 16.				
0	0 31 7.46	1.9423	N. 2 18 23.0	9.502	0	2 6 54.40	2.0605	N. 9 37 4.5	8.488
1	0 33 4.05	1.9440	2 27 53.0	9.498	1	2 8 58.13	2.0637	9 45 32.6	8.448
2	0 35 0.74	1.9457	2 37 22.7	9.493	2	2 11 2.04	2.0668	9 53 58.3	8.408
3	0 36 57.54	1.9475	2 46 52.1	9.487	3	2 13 6.15	2.0701	10 2 21.6	8.367
4	0 38 54.44	1.9493	2 56 21.1	9.481	4	2 15 10.45	2.0733	10 10 42.3	8.323
5	0 40 51.46	1.9512	3 5 49.8	9.475	5	2 17 14.95	2.0766	10 19 0.4	8.280
6	0 42 48.58	1.9530	3 15 18.1	9.467	6	2 19 19.64	2.0798	10 27 15.9	8.236
7	0 44 45.82	1.9549	3 24 45.8	9.458	7	2 21 24.53	2.0831	10 35 28.7	8.191
8	0 46 43.17	1.9568	3 34 13.1	9.450	8	2 23 29.61	2.0863	10 43 38.8	8.144
9	0 48 40.64	1.9588	3 43 39.8	9.441	9	2 25 34.89	2.0897	10 51 46.0	8.095
10	0 50 38.23	1.9608	3 53 6.0	9.431	10	2 27 40.37	2.0930	10 59 50.5	8.051
11	0 52 35.94	1.9628	4 2 31.5	9.419	11	2 29 46.05	2.0963	11 7 52.1	8.002
12	0 54 33.77	1.9649	4 11 56.3	9.407	12	2 31 51.93	2.0997	11 15 50.8	7.953
13	0 56 31.73	1.9671	4 21 20.4	9.395	13	2 33 58.01	2.1031	11 23 46.5	7.903
14	0 58 29.82	1.9692	4 30 43.7	9.382	14	2 36 4.30	2.1065	11 31 39.2	7.852
15	1 0 28.03	1.9713	4 40 6.3	9.369	15	2 38 10.79	2.1099	11 39 28.8	7.800
16	1 2 26.38	1.9736	4 49 28.0	9.354	16	2 40 17.49	2.1133	11 47 15.2	7.748
17	1 4 24.86	1.9758	4 58 48.8	9.338	17	2 42 24.39	2.1168	11 54 58.5	7.695
18	1 6 23.48	1.9782	5 8 8.6	9.323	18	2 44 31.50	2.1203	12 2 38.6	7.641
19	1 8 22.24	1.9804	5 17 27.5	9.306	19	2 46 38.82	2.1237	12 10 15.4	7.586
20	1 10 21.13	1.9828	5 26 45.3	9.288	20	2 48 46.34	2.1271	12 17 48.9	7.530
21	1 12 20.17	1.9852	5 36 2.1	9.271	21	2 50 54.07	2.1307	12 25 19.0	7.473
22	1 14 19.35	1.9876	5 45 17.8	9.252	22	2 53 2.02	2.1342	12 32 45.6	7.415
23	1 16 18.68	1.9900	5 54 32.3	9.232	23	2 55 10.17	2.1376	12 40 8.8	7.357
24	1 18 18.15	1.9924	N. 6 3 45.6	9.212	24	2 57 18.53	2.1411	N. 12 47 28.5	7.298

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 17.					TUESDAY 19.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
1	2 57 18.53	2.1411	N. 12 47 28.5	7.298	1	4 44 5.98	2.3040	N. 17 14 14.2	3.524
2	2 59 27.10	2.1447	12 54 44.6	7.238	2	4 46 24.31	2.3069	17 17 42.8	3.428
3	3 1 35.89	2.1483	13 1 57.1	7.177	3	4 48 42.81	2.3098	17 21 5.5	3.331
4	3 3 44.89	2.1518	13 9 5.9	7.115	4	4 51 1.48	2.3126	17 24 22.5	3.234
5	3 5 54.10	2.1553	13 16 10.9	7.053	5	4 53 20.32	2.3154	17 27 33.6	3.136
6	3 8 3.52	2.1588	13 23 12.2	6.990	6	4 55 39.33	2.3182	17 30 38.8	3.037
7	3 10 13.15	2.1623	13 30 9.7	6.926	7	4 57 58.51	2.3210	17 33 38.0	2.938
8	3 12 23.00	2.1659	13 37 3.3	6.861	8	5 0 17.85	2.3238	17 36 31.3	2.838
9	3 14 33.06	2.1694	13 43 53.0	6.795	9	5 2 37.36	2.3265	17 39 18.6	2.738
10	3 16 43.33	2.1729	13 50 38.7	6.728	10	5 4 57.03	2.3291	17 41 59.9	2.637
11	3 18 53.81	2.1765	13 57 20.3	6.660	11	5 7 16.85	2.3317	17 44 35.1	2.536
12	3 21 4.51	2.1801	14 3 57.9	6.592	12	5 9 36.83	2.3343	17 47 4.2	2.434
13	3 23 15.42	2.1836	14 10 31.4	6.523	13	5 11 56.96	2.3368	17 49 27.2	2.332
14	3 25 26.54	2.1872	14 17 0.7	6.453	14	5 14 17.24	2.3393	17 51 44.1	2.229
15	3 27 37.88	2.1908	14 23 25.8	6.383	15	5 16 37.67	2.3418	17 53 54.7	2.126
16	3 29 49.43	2.1943	14 29 46.6	6.311	16	5 18 58.25	2.3444	17 55 59.2	2.023
17	3 32 1.20	2.1978	14 36 3.1	6.238	17	5 21 18.97	2.3469	17 57 57.5	1.918
18	3 34 13.17	2.2013	14 42 15.2	6.165	18	5 23 39.83	2.3488	17 59 49.4	1.813
19	3 36 25.36	2.2049	14 48 22.9	6.092	19	5 26 0.83	2.3511	18 1 35.1	1.709
20	3 38 37.76	2.2084	14 54 26.2	6.017	20	5 28 21.96	2.3533	18 3 14.5	1.603
21	3 40 50.37	2.2120	15 0 24.9	5.941	21	5 30 43.23	2.3556	18 4 47.5	1.498
22	3 43 3.20	2.2155	15 6 19.1	5.865	22	5 33 4.63	2.3577	18 6 14.2	1.392
23	3 45 16.23	2.2189	15 12 8.7	5.788	23	5 35 26.15	2.3598	18 7 34.5	1.285
24	3 47 29.47	2.2224	N. 15 17 53.7	5.710	24	5 37 47.80	2.3618	N. 18 8 48.4	1.178
MONDAY 18.					WEDNESDAY 20.				
0	3 49 42.92	2.2259	N. 15 23 33.9	5.631	0	5 40 9.57	2.3638	N. 18 9 55.8	1.070
1	3 51 56.58	2.2294	15 29 9.4	5.552	1	5 42 31.46	2.3658	18 10 56.8	0.963
2	3 54 10.45	2.2329	15 34 40.1	5.472	2	5 44 53.46	2.3677	18 11 51.3	0.855
3	3 56 24.53	2.2363	15 40 6.0	5.391	3	5 47 15.58	2.3696	18 12 39.4	0.747
4	3 58 38.81	2.2397	15 45 27.0	5.308	4	5 49 37.81	2.3714	18 13 20.9	0.638
5	4 0 53.29	2.2431	15 50 43.0	5.226	5	5 52 0.15	2.3732	18 13 55.9	0.529
6	4 3 7.98	2.2466	15 55 54.1	5.143	6	5 54 22.59	2.3748	18 14 24.4	0.420
7	4 5 22.88	2.2500	16 1 0.2	5.059	7	5 56 45.13	2.3765	18 14 46.3	0.310
8	4 7 37.98	2.2533	16 6 1.2	4.974	8	5 59 7.77	2.3782	18 15 1.6	0.200
9	4 9 53.27	2.2566	16 10 57.1	4.889	9	6 1 30.51	2.3798	18 15 10.3	+ 0.090
10	4 12 8.77	2.2600	16 15 47.9	4.802	10	6 3 53.34	2.3813	18 15 12.4	- 0.020
11	4 14 24.47	2.2633	16 20 33.4	4.715	11	6 6 16.26	2.3828	18 15 7.9	0.130
12	4 16 40.36	2.2665	16 25 13.7	4.628	12	6 8 39.27	2.3842	18 14 56.8	0.240
13	4 18 56.45	2.2698	16 29 48.8	4.540	13	6 11 2.36	2.3856	18 14 39.1	0.351
14	4 21 12.74	2.2731	16 34 18.5	4.450	14	6 13 25.54	2.3869	18 14 14.7	0.463
15	4 23 29.22	2.2763	16 38 42.8	4.361	15	6 15 48.79	2.3881	18 13 43.6	0.574
16	4 25 45.89	2.2794	16 43 1.8	4.271	16	6 18 12.11	2.3893	18 13 5.8	0.685
17	4 28 2.75	2.2826	16 47 15.3	4.180	17	6 20 35.51	2.3905	18 12 21.4	0.796
18	4 30 19.80	2.2857	16 51 23.4	4.088	18	6 22 58.97	2.3916	18 11 50.3	0.907
19	4 32 37.04	2.2888	16 55 25.9	3.995	19	6 25 22.50	2.3928	18 10 32.6	1.018
20	4 34 54.46	2.2919	16 59 22.8	3.903	20	6 27 46.10	2.3938	18 9 28.1	1.131
21	4 37 12.07	2.2950	17 3 14.2	3.809	21	6 30 9.75	2.3947	18 8 16.9	1.242
22	4 39 29.86	2.2980	17 6 59.9	3.714	22	6 32 33.46	2.3956	18 6 59.1	1.353
23	4 41 47.83	2.3010	17 10 39.9	3.619	23	6 34 57.22	2.3965	18 5 34.5	1.466
24	4 44 5.98	2.3040	N. 17 14 14.2	3.524	24	6 37 21.04	2.3973	N. 18 4 3.2	1.578

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 21.					SATURDAY 23.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	6 37 21.04	2.3973	N. 18 4 3.2	1.578	0	8 32 29.36	2.3851	N. 14 42 42.2	6.679
1	6 39 44.90	2.3981	18 2 25.2	1.689	1	8 34 52.43	2.3840	14 35 58.6	6.774
2	6 42 8.81	2.3988	18 0 40 5	1.802	2	8 37 15.44	2.3829	14 29 9.3	6.869
3	6 44 32.76	2.3994	17 58 49.0	1.913	3	8 39 38.38	2.3818	14 22 14.3	6.962
4	6 46 56.74	2.4000	17 56 50.9	2.024	4	8 42 1.26	2.3807	14 15 13.8	7.055
5	6 49 20.76	2.4007	17 54 46.1	2.136	5	8 44 24.07	2.3796	14 8 7.7	7.148
6	6 51 44.82	2.4012	17 52 34.6	2.248	6	8 46 46.81	2.3783	14 0 56.1	7.239
7	6 54 8.90	2.4016	17 50 16.4	2.359	7	8 49 9.47	2.3772	13 53 39.0	7.330
8	6 56 33.01	2.4021	17 47 51.5	2.471	8	8 51 32.07	2.3761	13 46 16.5	7.419
9	6 58 57.15	2.4024	17 45 19.9	2.583	9	8 53 54.60	2.3748	13 38 48.7	7.508
10	7 1 21.30	2.4027	17 42 41.6	2.693	10	8 56 17.05	2.3736	13 31 15.5	7.597
11	7 3 45.47	2.4030	17 39 56.7	2.804	11	8 58 39.43	2.3723	13 23 37.1	7.684
12	7 6 9.66	2.4032	17 37 5.1	2.915	12	9 1 1.73	2.3711	13 15 53.4	7.772
13	7 8 33.86	2.4034	17 34 6.9	3.026	13	9 3 23.96	2.3698	13 8 4.5	7.858
14	7 10 58.07	2.4036	17 31 2.0	3.137	14	9 5 46.11	2.3686	13 0 10.5	7.943
15	7 13 22.29	2.4037	17 27 50.5	3.247	15	9 8 8.19	2.3673	12 52 11.4	8.027
16	7 15 46.51	2.4037	17 24 32.4	3.357	16	9 10 30.19	2.3661	12 44 7.2	8.111
17	7 18 10.73	2.4037	17 21 7.6	3.467	17	9 12 52.12	2.3648	12 35 58.1	8.193
18	7 20 34.95	2.4037	17 17 36.3	3.576	18	9 15 13.97	2.3635	12 27 44.1	8.275
19	7 22 59.17	2.4036	17 13 58.5	3.685	19	9 17 35.74	2.3623	12 19 25.1	8.357
20	7 25 23.38	2.4034	17 10 14.1	3.795	20	9 19 57.44	2.3610	12 11 1.3	8.437
21	7 27 47.58	2.4033	17 6 23.1	3.904	21	9 22 19.06	2.3597	12 2 32.7	8.516
22	7 30 11.77	2.4031	17 2 25.6	4.012	22	9 24 40.60	2.3583	11 53 59.4	8.593
23	7 32 35.95	2.4028	N. 16 58 21.7	4.120	23	9 27 2.06	2.3570	N. 11 45 21.5	8.671
FRIDAY 22.					SUNDAY 24.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	7 35 0.11	2.4025	N. 16 54 11.2	4.228	0	9 29 23.44	2.3557	N. 11 36 38.9	8.748
1	7 37 24.25	2.4022	16 49 54.3	4.336	1	9 31 44.74	2.3544	11 27 51.8	8.823
2	7 39 48.37	2.4018	16 45 30.9	4.443	2	9 34 5.97	2.3532	11 19 0.1	8.898
3	7 42 12.47	2.4014	16 41 1.2	4.549	3	9 36 27.12	2.3518	11 10 4.0	8.971
4	7 44 36.54	2.4009	16 36 25.0	4.656	4	9 38 48.19	2.3505	11 1 3.6	9.043
5	7 47 0.58	2.4004	16 31 42.5	4.762	5	9 41 9.18	2.3492	10 51 58.8	9.116
6	7 49 24.59	2.3999	16 26 53.6	4.868	6	9 43 30.09	2.3479	10 42 49.7	9.187
7	7 51 48.57	2.3994	16 21 58.4	4.973	7	9 45 50.93	2.3467	10 33 36.4	9.257
8	7 54 12.52	2.3988	16 16 56.9	5.076	8	9 48 11.69	2.3453	10 24 18.9	9.325
9	7 56 36.43	2.3982	16 11 49.2	5.181	9	9 50 32.37	2.3441	10 14 57.4	9.392
10	7 59 0.30	2.3974	16 6 35.2	5.285	10	9 52 52.98	2.3428	10 5 31.8	9.459
11	8 1 24.12	2.3967	16 1 15.0	5.388	11	9 55 13.51	2.3415	9 56 2.3	9.525
12	8 3 47.91	2.3961	15 55 48.6	5.491	12	9 57 33.96	2.3403	9 46 28.8	9.590
13	8 6 11.65	2.3953	15 50 16.1	5.593	13	9 59 54.34	2.3391	9 36 51.5	9.653
14	8 8 35.34	2.3945	15 44 37.5	5.694	14	10 2 14.65	2.3378	9 27 10.4	9.717
15	8 10 58.99	2.3937	15 38 52.8	5.796	15	10 4 34.88	2.3365	9 17 25.5	9.778
16	8 13 22.59	2.3928	15 33 2.0	5.897	16	10 6 55.03	2.3353	9 7 37.0	9.838
17	8 15 46.13	2.3919	15 27 5.2	5.997	17	10 9 15.12	2.3342	8 57 44.9	9.897
18	8 18 9.62	2.3911	15 21 2.4	6.096	18	10 11 35.13	2.3330	8 47 49.3	9.956
19	8 20 33.06	2.3902	15 14 53.7	6.194	19	10 13 55.08	2.3318	8 37 50.2	10.013
20	8 22 56.44	2.3892	15 8 39.1	6.292	20	10 16 14.95	2.3306	8 27 47.7	10.070
21	8 25 19.76	2.3882	15 2 18.6	6.390	21	10 18 34.75	2.3295	8 17 41.8	10.125
22	8 27 43.02	2.3872	14 55 52.3	6.487	22	10 20 54.49	2.3283	8 7 32.7	10.178
23	8 30 6.22	2.3862	14 49 20.1	6.584	23	10 23 14.15	2.3272	7 57 20.4	10.232
24	8 32 29.36	2.3851	N. 14 42 42.2	6.679	24	10 25 33.75	2.3261	N. 7 47 4.9	10.284

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 25.					WEDNESDAY 27.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	10 25 33.75	2.3261	N. 7 47 4.9	10.284	0	12 16 20.07	2.2983	S. 1 3 45.1	11.361
1	10 27 53.28	2.3250	7 36 46.3	10.334	1	12 18 37.97	2.2983	1 15 6.5	11.353
2	10 30 12.75	2.3240	7 26 24.8	10.383	2	12 20 55.87	2.2983	1 26 27.4	11.344
3	10 32 32.16	2.3230	7 16 0.3	10.432	3	12 23 13.77	2.2984	1 37 47.8	11.333
4	10 34 51.51	2.3219	7 5 32.9	10.480	4	12 25 31.68	2.2985	1 49 7.4	11.320
5	10 37 10.79	2.3208	6 55 2.7	10.526	5	12 27 49.59	2.2986	2 0 26.2	11.307
6	10 39 30.01	2.3198	6 44 29.8	10.571	6	12 30 7.51	2.2987	2 11 44.3	11.293
7	10 41 49.17	2.3189	6 33 54.2	10.614	7	12 32 25.43	2.2988	2 23 1.4	11.277
8	10 44 8.28	2.3179	6 23 16.1	10.657	8	12 34 43.36	2.2989	2 34 17.5	11.259
9	10 46 27.32	2.3169	6 12 35.4	10.699	9	12 37 1.30	2.2991	2 45 32.5	11.242
10	10 48 46.31	2.3161	6 1 52.2	10.739	10	12 39 19.25	2.2993	2 56 46.5	11.222
11	10 51 5.25	2.3152	5 51 6.7	10.778	11	12 41 37.21	2.2995	3 7 59.2	11.201
12	10 53 24.13	2.3143	5 40 18.8	10.817	12	12 43 55.19	2.2998	3 19 10.6	11.178
13	10 55 42.96	2.3134	5 29 28.7	10.853	13	12 46 13.18	2.3000	3 30 20.6	11.155
14	10 58 1.74	2.3126	5 18 36.5	10.888	14	12 48 31.19	2.3003	3 41 29.2	11.131
15	11 0 20.47	2.3118	5 7 42.1	10.923	15	12 50 49.21	2.3005	3 52 36.3	11.105
16	11 2 39.15	2.3109	4 56 45.7	10.956	16	12 53 7.25	2.3008	4 3 41.8	11.078
17	11 4 57.78	2.3102	4 45 47.4	10.988	17	12 55 25.30	2.3011	4 14 45.6	11.049
18	11 7 16.37	2.3095	4 34 47.2	11.018	18	12 57 43.38	2.3015	4 25 47.7	11.020
19	11 9 34.92	2.3088	4 23 45.2	11.048	19	13 0 1.48	2.3018	4 36 48.0	10.989
20	11 11 53.43	2.3081	4 12 41.5	11.076	20	13 2 19.60	2.3023	4 47 46.4	10.957
21	11 14 11.89	2.3073	4 1 36.1	11.103	21	13 4 37.75	2.3027	4 58 42.8	10.924
22	11 16 30.31	2.3067	3 50 29.1	11.130	22	13 6 55.92	2.3030	5 9 37.3	10.890
23	11 18 48.69	2.3061	N. 3 39 20.5	11.154	23	13 9 14.11	2.3034	S. 5 20 29.6	10.853
TUESDAY 26.					THURSDAY 28.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	11 21 7.04	2.3055	N. 3 28 10.6	11.177	0	13 11 32.33	2.3038	S. 5 31 19.7	10.817
1	11 23 25.35	2.3049	3 16 59.3	11.200	1	13 13 50.57	2.3043	5 42 7.6	10.778
2	11 25 43.63	2.3043	3 5 46.6	11.221	2	13 16 8.84	2.3048	5 52 53.1	10.738
3	11 28 1.87	2.3038	2 54 32.8	11.240	3	13 18 27.14	2.3053	6 3 36.2	10.698
4	11 30 20.08	2.3033	2 43 17.8	11.259	4	13 20 45.47	2.3057	6 14 16.9	10.657
5	11 32 38.27	2.3028	2 32 1.7	11.276	5	13 23 3.82	2.3061	6 24 55.0	10.613
6	11 34 56.42	2.3023	2 20 44.7	11.292	6	13 25 22.20	2.3067	6 35 30.5	10.569
7	11 37 14.55	2.3019	2 9 26.7	11.307	7	13 27 40.62	2.3072	6 46 3.3	10.524
8	11 39 32.65	2.3015	1 58 7.9	11.320	8	13 29 59.06	2.3077	6 56 33.4	10.478
9	11 41 50.73	2.3012	1 46 48.3	11.332	9	13 32 17.54	2.3082	7 7 0.7	10.431
10	11 44 8.79	2.3008	1 35 28.1	11.343	10	13 34 36.04	2.3087	7 17 25.1	10.383
11	11 46 26.82	2.3004	1 24 7.2	11.353	11	13 36 54.58	2.3093	7 27 46.6	10.333
12	11 48 44.84	2.3002	1 12 45.8	11.361	12	13 39 13.15	2.3098	7 38 5.0	10.281
13	11 51 2.84	2.2998	1 1 23.9	11.368	13	13 41 31.75	2.3103	7 48 20.3	10.229
14	11 53 20.82	2.2996	0 50 1.7	11.373	14	13 43 50.39	2.3108	7 58 32.5	10.176
15	11 55 38.79	2.2993	0 38 39.1	11.378	15	13 46 9.05	2.3113	8 8 41.4	10.122
16	11 57 56.74	2.2991	0 27 16.3	11.381	16	13 48 27.75	2.3119	8 18 47.1	10.067
17	12 0 14.68	2.2990	0 15 53.4	11.383	17	13 50 46.48	2.3125	8 28 49.4	10.010
18	12 2 32.62	2.2988	N. 0 4 30.4	11.383	18	13 53 5.25	2.3131	8 38 48.3	9.952
19	12 4 50.54	2.2986	S. 0 6 52.6	11.383	19	13 55 24.05	2.3136	8 48 43.7	9.893
20	12 7 8.45	2.2985	0 18 15.6	11.382	20	13 57 42.88	2.3142	8 58 35.5	9.833
21	12 9 26.36	2.2985	0 29 38.4	11.378	21	14 0 1.75	2.3148	9 8 23.7	9.773
22	12 11 44.27	2.2984	0 41 0.9	11.373	22	14 2 20.65	2.3153	9 18 8.3	9.712
23	12 14 2.17	2.2983	0 52 23.2	11.368	23	14 4 39.59	2.3159	9 27 49.2	9.649
24	12 16 20.07	2.2983	S. 1 3 45.1	11.361	24	14 6 58.56	2.3164	S. 9 37 26.2	9.585

GREENWICH MEAN TIME.																
THE MOON'S RIGHT ASCENSION AND DECLINATION.																
Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.			
FRIDAY 29.							SUNDAY, MAY 1.									
0	h	m	s	s	°	'	"	0	h	m	s	s	°	'	"	"
0	14	6	58.56	2.3164	S. 9	37	26.2	9.585	15	58	33.29	2.3243	S. 15	47	16.8	5.551
1	14	9	17.56	2.3170		9	46	59.3	9.520							
2	14	11	36.60	2.3175		9	56	28.6	9.454							
3	14	13	55.66	2.3180	10	5	53.8	9.387								
4	14	16	14.76	2.3186	10	15	15.0	9.319								
5	14	18	33.89	2.3191	10	24	32.1	9.251								
6	14	20	53.05	2.3196	10	33	45.1	9.181								
7	14	23	12.24	2.3202	10	42	53.8	9.110								
8	14	25	31.47	2.3207	10	51	58.3	9.038								
9	14	27	50.72	2.3211	11	0	58.4	8.966								
10	14	30	10.00	2.3215	11	9	54.2	8.893								
11	14	32	29.30	2.3220	11	18	45.5	8.818								
12	14	34	48.64	2.3225	11	27	32.3	8.743								
13	14	37	8.00	2.3229	11	36	14.6	8.667								
14	14	39	27.39	2.3234	11	44	52.3	8.589								
15	14	41	46.81	2.3238	11	53	25.3	8.511								
16	14	44	6.25	2.3242	12	1	53.6	8.433								
17	14	46	25.71	2.3245	12	10	17.2	8.353								
18	14	48	45.19	2.3249	12	18	36.0	8.273								
19	14	51	4.70	2.3253	12	26	49.9	8.192								
20	14	53	24.22	2.3256	12	34	59.0	8.109								
21	14	55	43.77	2.3259	12	43	3.0	8.026								
22	14	58	3.33	2.3262	12	51	2.1	7.943								
23	15	0	22.91	2.3264	S. 12	58	56.2	7.859								
SATURDAY 30.																
0	15	2	42.50	2.3267	S. 13	6	45.2	7.774								
1	15	5	2.11	2.3269	13	14	29.1	7.688								
2	15	7	21.73	2.3271	13	22	7.8	7.602								
3	15	9	41.36	2.3273	13	29	41.3	7.514								
4	15	12	1.00	2.3274	13	37	9.5	7.427								
5	15	14	20.65	2.3275	13	44	32.5	7.339								
6	15	16	40.30	2.3276	13	51	50.2	7.250								
7	15	18	59.96	2.3277	13	59	2.5	7.159								
8	15	21	19.63	2.3278	14	6	9.3	7.069								
9	15	23	39.29	2.3278	14	13	10.8	6.979								
10	15	25	58.96	2.3278	14	20	6.8	6.887								
11	15	28	18.63	2.3278	14	26	57.2	6.794								
12	15	30	38.29	2.3277	14	33	42.1	6.702								
13	15	32	57.95	2.3276	14	40	21.4	6.608								
14	15	35	17.60	2.3274	14	46	55.1	6.514								
15	15	37	37.24	2.3273	14	53	23.1	6.420								
16	15	39	56.87	2.3271	14	59	45.5	6.326								
17	15	42	16.49	2.3268	15	6	2.2	6.230								
18	15	44	36.09	2.3266	15	12	13.1	6.134								
19	15	46	55.68	2.3263	15	18	18.3	6.038								
20	15	49	15.25	2.3260	15	24	17.7	5.941								
21	15	51	34.80	2.3256	15	30	11.2	5.843								
22	15	53	54.32	2.3252	15	35	58.9	5.747								
23	15	56	13.82	2.3248	15	41	40.8	5.649								
24	15	58	33.29	2.3243	S. 15	47	16.8	5.551								
PHASES OF THE MOON.																
										d h m						
☾ Last Quarter . . . . . Apr.										7 5 53.4						
● New Moon . . . . .										15 9 53.2						
☾ First Quarter . . . . .										22 16 54.7						
○ Full Moon . . . . .										29 10 36.2						
										d h						
☾ Apogee . . . . . Apr.										10 9.5						
☾ Perigee . . . . .										26 6.6						

GREENWICH MEAN TIME.										
LUNAR DISTANCES.										
Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
1	Pollux	W.	92 21 22	2276	94 7 57	2289	95 54 12	2303	97 40 7	2318
	Regulus	W.	56 3 40	2196	57 52 14	2209	59 40 28	2222	61 28 23	2236
	Antares	E.	44 23 28	2318	42 37 54	2340	40 52 52	2364	39 8 25	2389
	α Aquilæ	E.	93 55 55	2610	92 17 14	2623	90 38 50	2636	89 0 44	2650
2	Regulus	W.	70 22 37	2311	72 8 21	2327	73 53 41	2344	75 38 37	2360
	Spica	W.	17 15 56	2433	18 58 44	2429	20 41 38	2429	22 24 32	2432
	Antares	E.	30 36 36	2561	28 56 48	2607	27 18 3	2661	25 40 30	2721
	α Aquilæ	E.	80 55 36	2740	79 19 49	2761	77 44 30	2785	76 9 42	2808
	SATURN	E.	99 26 42	2343	97 41 45	2359	95 57 11	2375	94 13 1	2392
3	Regulus	W.	84 17 8	2448	85 59 35	2465	87 41 37	2483	89 23 14	2502
	Spica	W.	30 56 26	2485	32 38 0	2500	34 19 14	2515	36 0 7	2529
	α Aquilæ	E.	68 23 48	2943	66 52 24	2974	65 21 39	3007	63 51 35	3040
	SATURN	E.	85 38 19	2480	83 56 38	2498	82 15 22	2516	80 34 31	2534
	Fomalhaut	E.	100 36 13	2822	99 2 14	2836	97 28 33	2851	95 55 11	2867
	VENUS	E.	115 23 58	2853	113 50 39	2872	112 17 44	2892	110 45 15	2912
4	Regulus	W.	97 44 59	2592	99 24 5	2610	101 2 46	2628	102 41 3	2646
	Spica	W.	44 19 10	2610	45 57 51	2627	47 36 10	2643	49 14 6	2660
	α Aquilæ	E.	56 32 11	3234	55 6 42	3279	53 42 6	3326	52 18 24	3375
	SATURN	E.	72 16 37	2627	70 38 18	2644	69 0 23	2663	67 22 53	2681
	Fomalhaut	E.	88 13 42	2955	86 42 33	2974	85 11 48	2993	83 41 27	3014
	VENUS	E.	103 9 4	3010	101 39 4	3030	100 9 29	3050	98 40 18	3069
	SUN	E.	127 48 18	2922	126 16 27	2941	124 45 0	2961	123 13 58	2980
5	Spica	W.	57 18 12	2742	58 53 56	2758	60 29 19	2773	62 4 22	2789
	α Aquilæ	E.	45 35 8	3674	44 17 53	3747	43 1 56	3825	41 47 20	3911
	SATURN	E.	59 21 21	2769	57 46 13	2786	56 11 27	2803	54 37 3	2819
	Fomalhaut	E.	76 16 6	3120	74 48 21	3143	73 21 3	3166	71 54 13	3189
	VENUS	E.	91 20 14	3163	89 53 21	3182	88 26 50	3200	87 0 41	3217
	SUN	E.	115 44 41	3073	114 15 58	3091	112 47 37	3108	111 19 37	3125
6	Spica	W.	69 54 36	2863	71 27 43	2877	73 0 32	2890	74 33 4	2902
	Antares	W.	25 36 45	3176	27 3 23	3157	28 30 24	3142	29 57 43	3132
	SATURN	E.	46 50 20	2899	45 18 0	2915	43 46 0	2930	42 14 19	2944
	Fomalhaut	E.	64 47 10	3314	63 23 15	3341	61 59 51	3368	60 36 58	3396
	VENUS	E.	79 54 56	3301	78 30 45	3316	77 6 52	3331	75 43 16	3345
	SUN	E.	104 4 43	3207	102 38 42	3222	101 12 59	3237	99 47 33	3251
7	Spica	W.	82 11 46	2962	83 42 47	2973	85 13 34	2982	86 44 9	2993
	Antares	W.	37 16 24	3113	38 44 18	3113	40 12 12	3114	41 40 4	3115

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
1	Pollux W.	99 25 41	2333	101 10 52	2349	102 55 40	2366	104 40 4	2383
	Regulus W.	63 15 57	2250	65 3 10	2265	66 50 1	2279	68 36 31	2296
	Antares E.	37 24 35	2418	35 41 26	2448	33 59 0	2482	32 17 22	2520
	α Aquilæ E.	87 22 57	2666	85 45 31	2683	84 8 28	2701	82 31 49	2720
2	Regulus W.	77 23 9	2378	79 7 16	2395	80 50 58	2412	82 34 16	2430
	Spica W.	24 7 21	2440	25 49 59	2449	27 32 24	2460	29 14 33	2472
	Antares E.	24 4 18	2792	22 29 39	2875	20 56 48	2976	19 26 5	3101
	α Aquilæ E.	74 35 24	2832	73 1 38	2859	71 28 26	2886	69 55 49	2914
	SATURN E.	92 29 15	2410	90 45 54	2427	89 2 57	2445	87 20 26	2462
3	Regulus W.	91 4 25	2520	92 45 11	2538	94 25 32	2556	96 5 28	2574
	Spica W.	37 40 40	2545	39 20 51	2561	41 0 40	2577	42 40 6	2593
	α Aquilæ E.	62 22 12	3076	60 53 33	3112	59 25 38	3151	57 58 30	3192
	SATURN E.	78 54 5	2553	77 14 5	2572	75 34 31	2589	73 55 21	2608
	Fomalhaut E.	94 22 10	2881	92 49 30	2900	91 17 11	2918	89 45 15	2936
	VENUS E.	109 13 11	2931	107 41 32	2950	106 10 17	2971	104 39 28	2991
4	Regulus W.	104 18 56	2663	105 56 25	2681	107 33 31	2699	109 10 13	2715
	Spica W.	50 51 40	2677	52 28 51	2693	54 5 40	2710	55 42 7	2726
	α Aquilæ E.	50 55 39	3428	49 33 54	3484	48 13 12	3543	46 53 35	3607
	SATURN E.	65 45 47	2699	64 9 5	2717	62 32 47	2735	60 56 53	2751
	Fomalhaut E.	82 11 31	3035	80 42 1	3055	79 12 56	3077	77 44 18	3098
	VENUS E.	97 11 30	3088	95 43 6	3108	94 15 6	3127	92 47 29	3145
	SUN E.	121 43 20	2999	120 13 6	3018	118 43 15	3036	117 13 47	3054
5	Spica W.	63 39 4	2805	65 13 26	2820	66 47 28	2834	68 21 12	2849
	α Aquilæ E.	40 34 11	4003	39 22 34	4104	38 12 36	4215	37 4 24	4334
	SATURN E.	53 3 0	2836	51 29 19	2852	49 55 59	2868	48 22 59	2884
	Fomalhaut E.	70 27 51	3213	69 1 57	3237	67 36 32	3262	66 11 36	3288
	VENUS E.	85 34 52	3235	84 9 24	3251	82 44 15	3268	81 19 26	3284
	SUN E.	109 51 58	3143	108 24 40	3159	106 57 42	3175	105 31 3	3191
6	Spica W.	76 5 20	2916	77 37 19	2928	79 9 3	2939	80 40 32	2951
	Antares W.	31 25 14	3124	32 52 54	3119	34 20 40	3115	35 48 31	3114
	SATURN E.	40 42 56	2958	39 11 51	2973	37 41 4	2987	36 10 35	3001
	Fomalhaut E.	59 14 37	3426	57 52 50	3456	56 31 37	3488	55 10 59	3520
	VENUS E.	74 19 57	3359	72 56 54	3372	71 34 6	3386	70 11 34	3399
	SUN E.	98 22 24	3265	96 57 31	3279	95 32 55	3291	94 8 33	3304
7	Spica W.	88 14 31	3002	89 44 42	3010	91 14 42	3019	92 44 31	3026
	Antares W.	43 7 55	3118	44 35 43	3119	46 3 29	3122	47 31 12	3124

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	III <sup>h</sup>	P. L. of Diff.	VI <sup>h</sup>	P. L. of Diff.	IX <sup>h</sup>	P. L. of Diff.
7	SATURN E.	34 40 23	3015	33 10 29	3028	31 40 51	3043	30 11 31	3056
	Fomalhaut E.	53 50 57	3555	52 31 33	3590	51 12 48	3629	49 54 45	3668
	VENUS E.	68 49 16	3412	67 27 13	3423	66 5 23	3434	64 43 45	3446
	SUN E.	92 44 26	3316	91 20 33	3327	89 56 53	3339	88 33 27	3350
8	Spica W.	94 14 11	3034	95 43 41	3041	97 13 3	3048	98 42 16	3054
	Antares W.	48 58 52	3127	50 26 29	3130	51 54 2	3132	53 21 33	3134
	VENUS E.	57 58 30	3492	56 37 57	3499	55 17 32	3507	53 57 16	3514
	SUN E.	81 39 6	3395	80 16 44	3403	78 54 31	3410	77 32 26	3416
9	Antares W.	60 38 27	3143	62 5 44	3145	63 32 59	3146	65 0 13	3146
	VENUS E.	47 17 34	3540	45 57 54	3544	44 38 18	3547	43 18 46	3549
	SUN E.	70 43 41	3443	69 22 13	3446	68 0 48	3450	66 39 28	3452
10	Antares W.	72 16 22	3145	73 43 37	3143	75 10 54	3142	76 38 13	3140
	VENUS E.	36 41 37	3555	35 22 14	3556	34 2 52	3555	32 43 29	3555
	SUN E.	59 53 18	3458	58 32 7	3458	57 10 56	3458	55 49 45	3457
11	Antares W.	83 55 26	3127	85 23 3	3124	86 50 44	3119	88 18 30	3116
	VENUS E.	26 6 9	3545	24 46 34	3541	23 26 55	3537	22 7 12	3534
	SUN E.	49 3 25	3446	47 42 1	3443	46 20 33	3440	44 59 2	3436
12	$\alpha$ Aquilæ W.	50 2 58	3792	51 18 9	3755	52 33 58	3720	53 50 24	3688
	SATURN W.	24 59 39	3119	26 27 26	3107	27 55 27	3096	29 23 42	3086
	SUN E.	38 10 13	3412	36 48 10	3407	35 26 2	3401	34 3 47	3395
13	$\alpha$ Aquilæ W.	60 20 34	3551	61 40 2	3527	62 59 56	3505	64 20 15	3484
	SATURN W.	36 48 0	3037	38 17 27	3027	39 47 6	3018	41 16 57	3008
	SUN E.	27 10 52	3366	25 47 57	3360	24 24 55	3354	23 1 46	3349
17	SUN W.	18 59 2	3082	20 27 34	3068	21 56 23	3055	23 25 28	3042
	Pollux E.	66 58 52	2808	65 24 35	2802	63 50 10	2796	62 15 37	2791
	Regulus E.	102 52 4	2711	101 15 38	2702	99 39 0	2693	98 2 10	2684
18	SUN W.	30 54 35	2985	32 25 6	2976	33 55 49	2965	35 26 46	2955
	Pollux E.	54 21 15	2769	52 46 7	2767	51 10 56	2765	49 35 42	2764
	Regulus E.	89 55 3	2640	88 17 2	2632	86 38 50	2624	85 0 27	2615
19	SUN W.	43 4 35	2906	44 36 46	2897	46 9 9	2888	47 41 43	2878
	Pollux E.	41 39 38	2775	40 4 37	2781	38 29 44	2789	36 55 2	2800
	Regulus E.	76 45 36	2573	75 6 4	2564	73 26 20	2556	71 46 25	2548
20	SUN W.	55 27 36	2832	57 1 22	2824	58 35 19	2814	60 9 29	2805
	Aldebaran W.	16 45 1	2502	18 26 12	2494	20 7 34	2485	21 49 8	2477
	Pollux E.	29 6 36	2913	27 34 34	2954	26 3 24	3006	24 33 19	3069
	Regulus E.	63 23 59	2507	61 42 56	2500	60 1 42	2492	58 20 17	2483
21	SUN W.	68 3 12	2760	69 38 32	2751	71 14 4	2743	72 49 47	2734
	Aldebaran W.	30 19 56	2435	32 2 41	2427	33 45 38	2419	35 28 46	2410



## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV <sup>h</sup>	P. L. of Diff.	XVIII <sup>h</sup>	P. L. of Diff.	XXI <sup>h</sup>	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
7	SATURN	E.	28 42 27	3070	27 13 41	3084	25 45 12	3100	24 17 2	3115
	Fomalhaut	E.	48 37 24	3710	47 20 47	3755	46 4 58	3803	44 49 59	3854
	VENUS	E.	63 22 20	3456	62 1 7	3465	60 40 4	3475	59 19 12	3484
	SUN	E.	87 10 13	3359	85 47 10	3369	84 24 18	3379	83 1 37	3387
8	Spica	W.	100 11 22	3060	101 40 21	3065	103 9 14	3070	104 38 0	3074
	Antares	W.	54 49 1	3137	56 16 26	3138	57 43 49	3141	59 11 9	3143
	VENUS	E.	52 37 7	3520	51 17 5	3525	49 57 9	3531	48 37 19	3535
	SUN	E.	76 10 28	3423	74 48 37	3429	73 26 53	3433	72 5 14	3439
9	Antares	W.	66 27 27	3147	67 54 40	3147	69 21 53	3146	70 49 7	3145
	VENUS	E.	41 59 16	3552	40 39 49	3554	39 20 24	3555	38 1 0	3555
	SUN	E.	65 18 10	3454	63 56 54	3456	62 35 41	3457	61 14 29	3458
10	Antares	W.	78 5 34	3138	79 32 57	3136	81 0 23	3133	82 27 53	3130
	VENUS	E.	31 24 5	3553	30 4 39	3551	28 45 11	3549	27 25 41	3547
	SUN	E.	54 28 33	3455	53 7 19	3451	51 46 4	3452	50 24 46	3449
11	Antares	W.	89 46 20	3111	91 14 16	3107	92 42 17	3102	94 10 24	3097
	VENUS	E.	20 47 26	3530	19 27 35	3526	18 7 40	3523	16 47 41	3518
	SUN	E.	43 37 26	3431	42 15 45	3428	40 54 0	3423	39 32 9	3418
12	α Aquilæ	W.	55 7 24	3658	56 24 56	3628	57 43 0	3601	59 1 33	3576
	SATURN	W.	30 52 9	3075	32 20 49	3065	33 49 41	3056	35 18 44	3046
	SUN	E.	32 41 25	3390	31 18 57	3385	29 56 23	3378	28 33 41	3372
13	α Aquilæ	W.	65 40 57	3463	67 2 2	3444	68 23 29	3426	69 45 16	3408
	SATURN	W.	42 47 0	2999	44 17 14	2990	45 47 39	2981	47 18 16	2971
	SUN	E.	21 38 31	3344	20 15 11	3339	18 51 45	3337	17 28 16	3335
17	SUN	W.	24 54 49	3030	26 24 24	3018	27 54 14	3007	29 24 18	2997
	Pollux	E.	60 40 57	2785	59 6 10	2781	57 31 17	2776	55 56 18	2773
	Regulus	E.	96 25 8	2675	94 47 54	2666	93 10 29	2658	91 32 52	2649
18	SUN	W.	36 57 55	2945	38 29 17	2935	40 0 51	2926	41 32 37	2916
	Pollux	E.	48 0 27	2764	46 25 12	2765	44 49 58	2766	43 14 46	2769
	Regulus	E.	83 21 52	2606	81 43 5	2598	80 4 7	2589	78 24 57	2581
19	SUN	W.	49 14 30	2869	50 47 29	2860	52 20 39	2851	53 54 1	2841
	Pollux	E.	35 20 34	2815	33 46 25	2832	32 12 39	2853	30 39 20	2880
	Regulus	E.	70 6 18	2540	68 26 0	2532	66 45 31	2524	65 4 51	2515
20	SUN	W.	61 43 50	2796	63 18 23	2787	64 53 8	2779	66 28 4	2769
	Aldebaran	W.	23 30 54	2468	25 12 52	2460	26 55 1	2451	28 37 23	2443
	Pollux	E.	23 4 32	3152	21 37 25	3254	20 12 20	3386	18 49 48	3559
	Regulus	E.	56 38 40	2475	54 56 52	2468	53 14 54	2460	51 32 44	2452
21	SUN	W.	74 25 42	2725	76 1 49	2716	77 38 8	2708	79 14 38	2699
	Aldebaran	W.	37 12 6	2402	38 55 38	2394	40 39 21	2386	42 23 16	2378

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
21	Regulus	E.	49 50 23	2444	48 7 51	2436	46 25 8	2429	44 42 15	2422
	Spica	E.	103 21 5	2448	101 38 38	2439	99 55 59	2430	98 13 7	2422
22	SUN	W.	80 51 19	2690	82 28 12	2681	84 5 17	2673	85 42 33	2665
	Aldebaran	W.	44 7 23	2370	45 51 41	2362	47 36 11	2354	49 20 52	2346
	Regulus	E.	36 5 13	2387	34 21 19	2380	32 37 16	2374	30 53 4	2369
	Spica	E.	89 35 55	2381	87 51 53	2373	86 7 40	2366	84 23 16	2358
23	SUN	W.	93 51 42	2624	95 30 5	2616	97 8 38	2608	98 47 22	2601
	Aldebaran	W.	58 7 9	2307	59 52 58	2300	61 38 58	2293	63 25 8	2285
	Spica	E.	75 38 29	2320	73 52 58	2313	72 7 18	2306	70 21 27	2299
24	SUN	W.	107 3 33	2565	108 43 16	2559	110 23 8	2552	112 3 9	2546
	Aldebaran	W.	72 18 33	2252	74 5 44	2245	75 53 4	2239	77 40 33	2234
	Pollux	W.	30 36 12	2588	32 15 23	2580	33 55 27	2573	35 36 16	2487
	Spica	E.	61 29 48	2268	59 43 1	2262	57 56 5	2256	56 9 1	2252
25	SUN	W.	120 25 8	2521	122 5 52	2517	123 46 42	2513	125 27 37	2510
	Aldebaran	W.	86 39 59	2208	88 28 14	2204	90 16 36	2200	92 5 3	2196
	Pollux	W.	44 9 13	2385	45 53 10	2370	47 37 28	2356	49 22 6	2344
	Spica	E.	47 12 2	2231	45 24 21	2229	43 36 36	2227	41 48 48	2225
	Antares	E.	92 59 5	2268	91 12 19	2261	89 25 26	2260	87 38 27	2256
26	Pollux	W.	58 8 58	2302	59 54 55	2296	61 41 0	2291	63 27 13	2287
	Regulus	W.	21 14 2	2224	23 1 54	2217	24 49 56	2212	26 38 6	2207
	Spica	E.	32 49 29	2227	31 1 42	2231	29 14 1	2235	27 26 26	2212
	Antares	E.	78 42 31	2246	76 55 12	2245	75 7 52	2246	73 20 33	2246
27	Pollux	W.	72 19 21	2279	74 5 52	2279	75 52 23	2280	77 38 52	2282
	Regulus	W.	35 40 3	2200	37 28 30	2201	39 16 56	2202	41 5 20	2204
	Antares	E.	64 24 27	2259	62 37 27	2264	60 50 34	2269	59 3 49	2275
	$\alpha$ Aquilæ	E.	112 20 49	2684	110 43 48	2674	109 6 33	2666	107 29 8	2660
28	Pollux	W.	86 30 19	2301	88 16 17	2306	90 2 8	2313	91 47 49	2320
	Regulus	W.	50 6 15	2224	51 54 7	2229	53 41 51	2235	55 29 26	2241
	Antares	E.	50 12 41	2319	48 27 9	2331	46 41 55	2344	44 56 59	2358
	$\alpha$ Aquilæ	E.	99 20 34	2651	97 42 48	2654	96 5 4	2657	94 27 26	2661
29	Regulus	W.	64 24 42	2282	66 11 8	2291	67 57 21	2301	69 43 19	2312
	Antares	E.	36 18 19	2457	34 36 5	2483	32 54 28	2514	31 13 34	2547
	$\alpha$ Aquilæ	E.	86 21 24	2704	84 44 49	2716	83 8 30	2729	81 32 29	2744
30	Regulus	W.	78 29 10	2369	80 13 29	2382	81 57 29	2395	83 41 11	2408
	Spica	W.	25 11 34	2427	26 54 30	2433	28 37 18	2440	30 19 56	2448
	$\alpha$ Aquilæ	E.	73 37 44	2855	72 4 2	2858	70 30 49	2880	68 58 5	2906
	SATURN	E.	93 16 19	2389	91 32 29	2403	89 48 58	2415	88 5 45	2429
	Fomalhaut	E.	105 53 47	2758	104 18 24	2764	102 43 9	2772	101 8 5	2781

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
21	Regulus	E.	42 59 11	2415	41 15 57	2408	39 32 33	2400	37 48 58	2393
	Spica	E.	96 30 4	2414	94 46 49	2406	93 3 23	2398	91 19 45	2389
22	SUN	W.	87 20 0	2656	88 57 39	2648	90 35 29	2640	92 13 30	2632
	Aldebaran	W.	51 5 45	2338	52 50 49	2330	54 36 5	2323	56 21 31	2315
	Regulus	E.	29 8 44	2363	27 24 16	2359	25 39 42	2355	23 55 3	2352
	Spica	E.	82 38 41	2350	80 53 54	2343	79 8 57	2335	77 23 48	2328
23	SUN	W.	100 26 16	2593	102 5 21	2585	103 44 36	2579	105 24 0	2572
	Aldebaran	W.	65 11 29	2279	66 58 0	2272	68 44 41	2265	70 31 32	2258
	Spica	E.	68 35 26	2293	66 49 16	2286	65 2 56	2279	63 16 26	2274
24	SUN	W.	113 43 18	2541	115 23 34	2535	117 3 59	2530	118 44 30	2525
	Aldebaran	W.	79 28 10	2228	81 15 56	2223	83 3 49	2218	84 51 50	2213
	Pollux	W.	37 17 47	2462	38 59 53	2439	40 42 32	2419	42 25 39	2401
	Spica	E.	54 21 50	2247	52 34 32	2243	50 47 8	2239	48 59 38	2235
25	SUN	W.	127 8 37	2507	128 49 41	2504	130 30 49	2502	132 11 59	2500
	Aldebaran	W.	93 53 36	2193	95 42 14	2190	97 30 56	2188	99 19 42	2186
	Pollux	W.	51 7 1	2334	52 52 11	2324	54 37 35	2316	56 23 11	2309
	Spica	E.	40 0 57	2224	38 13 5	2223	36 25 12	2224	34 37 20	2225
	Antares	E.	85 51 23	2253	84 4 15	2251	82 17 3	2249	80 29 48	2247
26	Pollux	W.	65 13 31	2284	66 59 54	2281	68 46 21	2280	70 32 50	2279
	Regulus	W.	28 26 23	2204	30 14 44	2202	32 3 8	2200	33 51 35	2200
	Spica	E.	25 39 1	2250	23 51 48	2262	22 4 52	2276	20 18 17	2294
	Antares	E.	71 33 14	2247	69 45 57	2249	67 58 43	2252	66 11 33	2255
27	Pollux	W.	79 25 18	2284	81 11 41	2287	82 58 0	2291	84 44 12	2295
	Regulus	W.	42 53 41	2208	44 41 57	2211	46 30 9	2215	48 18 15	2219
	Antares	E.	57 17 12	2282	55 30 46	2289	53 44 31	2298	51 58 29	2308
	α Aquilæ	E.	105 51 34	2655	104 13 54	2652	102 36 9	2650	100 58 22	2649
28	Pollux	W.	93 33 20	2328	95 18 39	2336	97 3 46	2344	98 48 41	2354
	Regulus	W.	57 16 52	2249	59 4 7	2256	60 51 11	2264	62 38 3	2273
	Antares	E.	43 12 24	2374	41 28 12	2392	39 44 26	2411	38 1 7	2433
	α Aquilæ	E.	92 49 54	2667	91 12 30	2675	89 35 16	2683	87 58 13	2693
29	Regulus	W.	71 29 1	2322	73 14 28	2333	74 59 39	2345	76 44 33	2357
	Antares	E.	29 33 26	2585	27 54 11	2630	26 15 57	2682	24 38 53	2743
	α Aquilæ	E.	79 56 47	2760	78 21 26	2777	76 46 28	2795	75 11 53	2815
30	Regulus	W.	85 24 34	2422	87 7 38	2436	88 50 22	2450	90 32 46	2465
	Spica	W.	32 2 22	2457	33 44 35	2467	35 26 34	2479	37 8 16	2491
	α Aquilæ	E.	67 25 54	2932	65 54 16	2961	64 23 14	2990	62 52 49	3022
	SATURN	E.	86 22 51	2413	84 40 17	2456	82 58 2	2470	81 16 7	2485
	Fomalhaut	E.	99 33 12	2791	97 58 32	2802	96 24 6	2813	94 49 55	2825

## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S						Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.				
		h m s	s	° ' "	"	' "	s	m s	s	
SUN.	1	2 32 58.72	9.536	N. 15 1 47.1	+ 45.45	15 53.90	66.02	2 57.04	0.320	
Mon.	2	2 36 47.85	9.559	15 19 50.5	44.82	15 53.66	66.10	3 4.45	0.298	
Tues.	3	2 40 37.52	9.582	15 37 38.7	44.19	15 53.42	66.18	3 11.33	0.274	
Wed.	4	2 44 27.77	9.605	15 55 11.5	+ 43.54	15 53.19	66.26	3 17.63	0.250	
Thur.	5	2 48 18.58	9.629	16 12 28.5	42.88	15 52.95	66.34	3 23.35	0.226	
Frid.	6	2 52 9.98	9.654	16 29 29.5	42.20	15 52.72	66.42	3 28.49	0.202	
Sat.	7	2 56 1.95	9.678	16 46 14.1	+ 41.51	15 52.49	66.50	3 33.05	0.178	
SUN.	8	2 59 54.51	9.703	17 2 42.0	40.81	15 52.27	66.58	3 37.03	0.154	
Mon.	9	3 3 47.66	9.727	17 18 53.0	40.10	15 52.04	66.66	3 40.43	0.129	
Tues.	10	3 7 41.40	9.752	17 34 46.8	+ 39.37	15 51.82	66.74	3 43.23	0.105	
Wed.	11	3 11 35.74	9.776	17 50 22.9	38.63	15 51.60	66.82	3 45.45	0.080	
Thur.	12	3 15 30.66	9.801	18 5 41.2	37.88	15 51.39	66.91	3 47.08	0.056	
Frid.	13	3 19 26.17	9.825	18 20 41.3	+ 37.12	15 51.18	66.99	3 48.12	0.031	
Sat.	14	3 23 22.27	9.849	18 35 23.0	36.35	15 50.97	67.07	3 48.58	0.007	
SUN.	15	3 27 18.94	9.873	18 49 46.0	35.56	15 50.77	67.15	3 48.46	0.017	
Mon.	16	3 31 16.17	9.897	19 3 49.9	+ 34.76	15 50.57	67.23	3 47.78	0.040	
Tues.	17	3 35 13.98	9.920	19 17 34.4	33.95	15 50.38	67.32	3 46.53	0.063	
Wed.	18	3 39 12.33	9.943	19 30 59.4	33.13	15 50.20	67.40	3 44.75	0.086	
Thur.	19	3 43 11.24	9.965	19 44 4.5	+ 32.29	15 50.02	67.48	3 42.41	0.109	
Frid.	20	3 47 10.67	9.987	19 56 49.4	31.44	15 49.84	67.56	3 39.53	0.131	
Sat.	21	3 51 10.63	10.009	20 9 14.0	30.58	15 49.66	67.64	3 36.13	0.152	
SUN.	22	3 55 11.11	10.031	20 21 17.8	+ 29.72	15 49.49	67.71	3 32.22	0.173	
Mon.	23	3 59 12.10	10.052	20 33 0.7	28.85	15 49.32	67.78	3 27.80	0.194	
Tues.	24	4 3 13.59	10.072	20 44 22.4	27.96	15 49.15	67.85	3 22.88	0.215	
Wed.	25	4 7 15.57	10.092	20 55 22.8	+ 27.06	15 48.99	67.92	3 17.47	0.235	
Thur.	26	4 11 18.04	10.112	21 6 1.5	26.16	15 48.83	67.99	3 11.57	0.255	
Frid.	27	4 15 20.97	10.132	21 16 18.4	25.24	15 48.67	68.06	3 5.21	0.275	
Sat.	28	4 19 24.38	10.152	21 26 13.2	+ 24.32	15 48.52	68.12	2 58.37	0.294	
SUN.	29	4 23 28.25	10.171	21 35 45.8	23.39	15 48.38	68.19	2 51.08	0.313	
Mon.	30	4 27 32.57	10.189	21 44 55.9	22.45	15 48.23	68.25	2 43.34	0.332	
Tues.	31	4 31 37.33	10.207	21 53 43.4	21.50	15 48.08	68.31	2 35.16	0.350	
Wed.	32	4 35 42.52	10.225	N. 22 2 8.1	+ 20.55	15 47.94	68.37	2 26.55	0.367	

NOTE.—The mean time of semidiameter passing the meridian may be found by subtracting 0.18 from the sidereal time. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

## AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ' "	"	m s	s	h m s
SUN.	1	2 32 59.19	9.536	N.15 1 49.4	+45.46	2 57.06	0.320	2 35 56.26
Mon.	2	2 36 48.34	9.559	15 19 52.8	44.83	3 4.47	0.298	2 39 52.82
Tues.	3	2 40 38.03	9.582	15 37 41.1	44.19	3 11.34	0.275	2 43 49.37
Wed.	4	2 44 28.30	9.606	15 55 13.9	+43.54	3 17.64	0.251	2 47 45.92
Thur.	5	2 48 19.13	9.630	16 12 30.9	42.88	3 23.36	0.226	2 51 42.48
Frid.	6	2 52 10.54	9.654	16 29 31.9	42.20	3 28.50	0.202	2 55 39.03
Sat.	7	2 56 2.52	9.678	16 46 16.5	+41.51	3 33.06	0.178	2 59 35.59
SUN.	8	2 59 55.10	9.703	17 2 44.5	40.81	3 37.04	0.154	3 3 32.14
Mon.	9	3 3 48.26	9.727	17 18 55.5	40.10	3 40.44	0.129	3 7 28.70
Tues.	10	3 7 42.01	9.752	17 34 49.2	+39.37	3 43.24	0.104	3 11 25.25
Wed.	11	3 11 36.35	9.776	17 50 25.3	38.63	3 45.45	0.080	3 15 21.80
Thur.	12	3 15 31.28	9.801	18 5 43.6	37.88	3 47.08	0.056	3 19 18.36
Frid.	13	3 19 26.79	9.825	18 20 43.7	+37.12	3 48.12	0.031	3 23 14.91
Sat.	14	3 23 22.89	9.849	18 35 25.3	36.35	3 48.58	0.007	3 27 11.47
SUN.	15	3 27 19.56	9.873	18 49 48.2	35.56	3 48.46	0.017	3 31 8.03
Mon.	16	3 31 16.80	9.897	19 3 52.1	+34.76	3 47.78	0.040	3 35 4.58
Tues.	17	3 35 14.60	9.920	19 17 36.6	33.95	3 46.53	0.063	3 39 1.13
Wed.	18	3 39 12.95	9.943	19 31 1.5	33.13	3 44.74	0.086	3 42 57.69
Thur.	19	3 43 11.85	9.965	19 44 6.5	+32.29	3 42.40	0.109	3 46 54.25
Frid.	20	3 47 11.28	9.987	19 56 51.3	31.44	3 39.52	0.131	3 50 50.80
Sat.	21	3 51 11.23	10.009	20 9 15.8	30.58	3 36.12	0.152	3 54 47.36
SUN.	22	3 55 11.70	10.030	20 21 19.6	+29.72	3 32.21	0.174	3 58 43.91
Mon.	23	3 59 12.68	10.051	20 33 2.4	28.85	3 27.79	0.195	4 2 40.47
Tues.	24	4 3 14.16	10.072	20 44 24.0	27.96	3 22.87	0.215	4 6 37.02
Wed.	25	4 7 16.12	10.092	20 55 24.3	+27.06	3 17.46	0.236	4 10 33.58
Thur.	26	4 11 18.57	10.112	21 6 2.9	26.15	3 11.56	0.255	4 14 30.14
Frid.	27	4 15 21.49	10.132	21 16 19.7	25.24	3 5.20	0.275	4 18 26.69
Sat.	28	4 19 24.88	10.151	21 26 14.4	+24.32	2 58.36	0.295	4 22 23.25
SUN.	29	4 23 28.73	10.170	21 35 46.9	23.39	2 51.07	0.314	4 26 19.80
Mon.	30	4 27 33.03	10.188	21 44 56.9	22.45	2 43.33	0.332	4 30 16.36
Tues.	31	4 31 37.77	10.206	21 53 44.3	21.50	2 35.15	0.350	4 34 12.92
Wed.	32	4 35 42.93	10.224	N.22 2 8.9	+20.55	2 26.54	0.367	4 38 9.47

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.  
The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

Diff. for 1 Hour,  
+9°.8565  
(Table III.)

AT GREENWICH MEAN NOON.										
Day of the Month.	Day of the Year.	THE SUN'S					Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.	
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.					
		λ	λ'							
		°	'	"	"			h	m	s
1	122	40	40	29.3	40 15.2	145.44	+ 0.13	0.003 4450	+ 45.5	21 20 33.37
2	123	41	38	38.9	38 24.8	145.37	0.18	0.003 5540	45.3	21 16 37.47
3	124	42	36	47.0	36 32.7	145.31	0.21	0.003 6625	45.1	21 12 41.56
4	125	43	34	53.6	34 39.2	145.24	+ 0.19	0.003 7703	+ 44.8	21 8 45.65
5	126	44	32	58.7	32 44.2	145.18	0.16	0.003 8773	44.4	21 4 49.74
6	127	45	31	2.4	30 47.8	145.12	0.11	0.003 9832	43.9	21 0 53.84
7	128	46	29	4.7	28 49.9	145.07	+ 0.02	0.004 0881	+ 43.4	20 56 57.93
8	129	47	27	5.6	26 50.8	145.01	— 0.08	0.004 1917	42.9	20 53 2.02
9	130	48	25	5.2	24 50.2	144.95	0.19	0.004 2940	42.3	20 49 6.11
10	131	49	23	3.5	22 48.3	144.89	— 0.31	0.004 3948	+ 41.7	20 45 10.20
11	132	50	21	0.4	20 45.1	144.84	0.43	0.004 4940	41.0	20 41 14.29
12	133	51	18	55.9	18 40.5	144.79	0.56	0.004 5915	40.3	20 37 18.38
13	134	52	16	50.1	16 34.6	144.73	— 0.67	0.004 6872	+ 39.5	20 33 22.47
14	135	53	14	42.9	14 27.3	144.67	0.76	0.004 7809	38.7	20 29 26.56
15	136	54	12	34.3	12 18.5	144.61	0.83	0.004 8727	37.8	20 25 30.65
16	137	55	10	24.3	10 8.3	144.55	— 0.88	0.004 9624	+ 37.0	20 21 34.75
17	138	56	8	12.7	7 56.6	144.49	0.90	0.005 0501	36.1	20 17 38.84
18	139	57	5	59.6	5 43.4	144.42	0.88	0.005 1357	35.3	20 13 42.93
19	140	58	3	45.0	3 28.6	144.36	— 0.84	0.005 2193	+ 34.5	20 9 47.02
20	141	59	1	28.7	1 12.2	144.29	0.77	0.005 3010	33.7	20 5 51.11
21	142	59	59	10.8	58 54.2	144.22	0.68	0.005 3809	32.9	20 1 55.20
22	143	60	56	51.3	56 34.6	144.15	— 0.55	0.005 4591	+ 32.2	19 57 59.29
23	144	61	54	30.3	54 13.4	144.09	0.42	0.005 5357	31.6	19 54 3.38
24	145	62	52	7.6	51 50.6	144.03	0.28	0.005 6108	31.0	19 50 7.47
25	146	63	49	43.5	49 26.3	143.97	— 0.14	0.005 6846	+ 30.5	19 46 11.56
26	147	64	47	17.9	47 0.6	143.91	— 0.01	0.005 7571	30.0	19 42 15.65
27	148	65	44	51.0	44 33.5	143.85	+ 0.10	0.005 8285	29.5	19 38 19.74
28	149	66	42	22.8	42 5.2	143.80	+ 0.18	0.005 8987	+ 29.0	19 34 23.83
29	150	67	39	53.5	39 35.7	143.75	0.24	0.005 9679	28.6	19 30 27.92
30	151	68	37	23.0	37 5.0	143.71	0.26	0.006 0359	28.1	19 26 32.01
31	152	69	34	51.6	34 33.5	143.67	0.25	0.006 1027	27.6	19 22 36.10
32	153	70	32	19.2	32 1.0	143.63	+ 0.23	0.006 1683	+ 27.1	19 18 40.19

NOTE.—The longitudes in the column λ are referred to the true equinox of their own date, while those in the column λ' are referred to the mean equinox of the beginning of the Besselian fictitious year.

Diff. for 1 Hour.  
—9'.8296.  
(Table 11.)

## GREENWICH MEAN TIME.

## THE MOON'S

Day of the Month.									
	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	' "	' "	' "	"	' "	"	h m	m	d
1	15 48.2	15 42.1	57 54.2	- 1.85	57 31.5	- 1.91	13 52.5	2.23	15.6
2	15 35.8	15 29.5	57 8.4	1.92	56 45.3	1.90	14 45.6	2.19	16.6
3	15 23.4	15 17.5	56 22.8	1.84	56 1.2	1.75	15 37.4	2.12	17.6
4	15 11.9	15 6.8	55 40.8	- 1.63	55 22.1	- 1.48	16 27.4	2.04	18.6
5	15 2.3	14 58.2	55 5.3	1.31	54 50.6	1.13	17 15.4	1.96	19.6
6	14 54.9	14 52.2	54 38.2	0.93	54 28.3	0.72	18 1.5	1.89	20.6
7	14 50.2	14 48.9	54 20.9	- 0.50	54 16.1	- 0.29	18 46.0	1.83	21.6
8	14 48.3	14 48.3	54 13.9	- 0.08	54 14.2	+ 0.13	19 29.4	1.80	22.6
9	14 49.1	14 50.5	54 17.1	+ 0.34	54 22.3	0.53	20 12.3	1.79	23.6
10	14 52.6	14 55.2	54 29.9	+ 0.71	54 39.5	+ 0.88	20 55.4	1.81	24.6
11	14 58.4	15 2.0	54 51.0	1.03	55 4.2	1.16	21 39.4	1.86	25.6
12	15 6.0	15 10.3	55 18.9	1.27	55 34.8	1.36	22 25.0	1.94	26.6
13	15 14.8	15 19.6	55 51.5	+ 1.42	56 8.9	+ 1.46	23 12.6	2.04	27.6
14	15 24.4	15 29.2	56 26.6	1.48	56 44.3	1.46	6		28.6
15	15 34.0	15 38.6	57 1.8	1.43	57 18.7	1.38	0 2.9	2.14	0.0
16	15 43.0	15 47.2	57 35.0	+ 1.31	57 50.3	+ 1.23	0 55.6	2.25	1.0
17	15 51.0	15 54.6	58 4.5	1.13	58 17.6	1.04	1 50.5	2.32	2.0
18	15 57.8	16 0.7	58 29.3	0.93	58 39.8	0.82	2 46.8	2.36	3.0
19	16 3.1	16 5.3	58 48.9	+ 0.70	58 56.8	+ 0.60	3 43.4	2.35	4.0
20	16 7.1	16 8.5	59 3.3	0.49	59 8.6	0.39	4 39.4	2.31	5.0
21	16 9.6	16 10.4	59 12.7	0.29	59 15.6	+ 0.19	5 34.2	2.25	6.0
22	16 10.8	16 11.0	59 17.2	+ 0.09	59 17.7	- 0.01	6 27.6	2.20	7.0
23	16 10.8	16 10.2	59 16.9	- 0.12	59 14.8	0.23	7 19.8	2.16	8.0
24	16 9.2	16 7.9	59 11.3	0.35	59 6.3	0.47	8 11.5	2.15	9.0
25	16 6.2	16 3.9	58 59.9	- 0.60	58 51.9	- 0.73	9 3.0	2.16	10.0
26	16 1.4	15 58.3	58 42.4	0.86	58 31.2	0.99	9 55.0	2.18	11.0
27	15 54.9	15 51.0	58 18.5	1.11	58 4.4	1.23	10 47.5	2.20	12.0
28	15 46.8	15 42.3	57 49.0	- 1.33	57 32.4	- 1.42	11 40.7	2.20	13.0
29	15 37.6	15 32.6	57 15.0	1.48	56 56.9	1.52	12 33.9	2.20	14.0
30	15 27.6	15 22.6	56 38.4	1.54	56 19.9	1.53	13 26.5	2.17	15.0
31	15 17.6	15 12.8	56 1.6	1.50	55 43.9	1.43	14 17.9	2.10	16.0
32	15 8.2	15 3.9	55 27.1	- 1.35	55 11.6	- 1.24	15 7.4	2.02	17.0

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION:

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 1.					TUESDAY 3.				
0	15 58 33.29	2.3243	S. 15 47 16.8	5.551	0	17 48 50.28	2.2557	S. 18 16 44.8	0.669
1	16 0 52.73	2.3238	15 52 46.9	5.452	1	17 51 5.55	2.2533	18 17 22.0	0.570
2	16 3 12.14	2.3233	15 58 11.0	5.353	2	17 53 20.67	2.2508	18 17 53.2	0.470
3	16 5 31.52	2.3227	16 3 29.2	5.253	3	17 55 35.64	2.2483	18 18 18.4	0.371
4	16 7 50.87	2.3221	16 8 41.4	5.154	4	17 57 50.47	2.2459	18 18 37.7	0.273
5	16 10 10.17	2.3213	16 13 47.7	5.054	5	18 0 5.15	2.2434	18 18 51.1	0.174
6	16 12 29.43	2.3207	16 18 47.9	4.953	6	18 2 19.68	2.2409	18 18 58.6	-0.077
7	16 14 48.65	2.3200	16 23 42.1	4.853	7	18 4 34.06	2.2383	18 19 0.3	+0.021
8	16 17 7.83	2.3192	16 28 30.2	4.752	8	18 6 48.28	2.2357	18 18 56.1	0.119
9	16 19 26.96	2.3184	16 33 12.3	4.651	9	18 9 2.34	2.2331	18 18 46.0	0.216
10	16 21 46.04	2.3176	16 37 48.3	4.550	10	18 11 16.25	2.2305	18 18 30.2	0.313
11	16 24 5.07	2.3167	16 42 18.3	4.448	11	18 13 30.00	2.2278	18 18 8.5	0.409
12	16 26 24.04	2.3158	16 46 42.1	4.346	12	18 15 43.59	2.2251	18 17 41.1	0.505
13	16 28 42.96	2.3148	16 50 59.8	4.244	13	18 17 57.01	2.2223	18 17 7.9	0.601
14	16 31 1.81	2.3138	16 55 11.4	4.142	14	18 20 10.27	2.2197	18 16 29.0	0.696
15	16 33 20.61	2.3127	16 59 16.9	4.040	15	18 22 23.37	2.2168	18 15 44.4	0.791
16	16 35 39.34	2.3116	17 3 16.2	3.938	16	18 24 36.29	2.2140	18 14 54.1	0.885
17	16 37 58.00	2.3105	17 7 9.4	3.836	17	18 26 49.05	2.2112	18 13 58.2	0.979
18	16 40 16.60	2.3093	17 10 56.5	3.733	18	18 29 1.64	2.2083	18 12 56.6	1.073
19	16 42 35.12	2.3081	17 14 37.4	3.630	19	18 31 14.05	2.2054	18 11 49.4	1.166
20	16 44 53.57	2.3068	17 18 12.1	3.527	20	18 33 26.29	2.2026	18 10 36.7	1.258
21	16 47 11.94	2.3056	17 21 40.6	3.424	21	18 35 38.36	2.1997	18 9 18.4	1.352
22	16 49 30.24	2.3043	17 25 3.0	3.322	22	18 37 50.25	2.1968	18 7 54.5	1.443
23	16 51 48.45	2.3028	S. 17 28 19.2	3.218	23	18 40 1.97	2.1938	S. 18 6 25.2	1.534
MONDAY 2.					WEDNESDAY 4.				
0	16 54 6.58	2.3014	S. 17 31 29.2	3.115	0	18 42 13.51	2.1908	S. 18 4 50.4	1.625
1	16 56 24.62	2.3000	17 34 33.0	3.013	1	18 44 24.87	2.1878	18 3 10.2	1.716
2	16 58 42.58	2.2985	17 37 30.7	2.910	2	18 46 36.05	2.1848	18 1 24.5	1.807
3	17 1 0.44	2.2969	17 40 22.2	2.807	3	18 48 47.05	2.1818	17 59 33.4	1.896
4	17 3 18.21	2.2953	17 43 7.5	2.703	4	18 50 57.87	2.1788	17 57 37.0	1.984
5	17 5 35.88	2.2937	17 45 46.6	2.601	5	18 53 8.51	2.1758	17 55 35.3	2.073
6	17 7 53.45	2.2921	17 48 19.6	2.498	6	18 55 18.96	2.1727	17 53 28.2	2.162
7	17 10 10.93	2.2904	17 50 46.4	2.395	7	18 57 29.23	2.1696	17 51 15.9	2.249
8	17 12 28.30	2.2886	17 53 7.0	2.292	8	18 59 39.31	2.1665	17 48 58.3	2.337
9	17 14 45.56	2.2868	17 55 21.4	2.189	9	19 1 49.21	2.1634	17 46 35.5	2.423
10	17 17 2.72	2.2851	17 57 29.7	2.087	10	19 3 58.92	2.1603	17 44 7.5	2.510
11	17 19 19.77	2.2832	17 59 31.9	1.985	11	19 6 8.45	2.1572	17 41 34.3	2.596
12	17 21 36.70	2.2813	18 1 27.9	1.883	12	19 8 17.79	2.1541	17 38 56.0	2.681
13	17 23 53.52	2.2793	18 3 17.8	1.781	13	19 10 26.94	2.1509	17 36 12.6	2.765
14	17 26 10.22	2.2773	18 5 1.6	1.678	14	19 12 35.90	2.1478	17 33 24.2	2.849
15	17 28 26.80	2.2753	18 6 39.2	1.577	15	19 14 44.67	2.1446	17 30 30.7	2.933
16	17 30 43.26	2.2733	18 8 10.8	1.475	16	19 16 53.25	2.1413	17 27 32.2	3.017
17	17 32 59.59	2.2712	18 9 36.2	1.373	17	19 19 1.63	2.1382	17 24 28.7	3.100
18	17 35 15.80	2.2691	18 10 55.6	1.273	18	19 21 9.83	2.1351	17 21 20.2	3.183
19	17 37 31.88	2.2669	18 12 8.9	1.172	19	19 23 17.84	2.1319	17 18 6.9	3.263
20	17 39 47.83	2.2647	18 13 16.2	1.071	20	19 25 25.66	2.1287	17 14 48.6	3.345
21	17 42 3.65	2.2625	18 14 17.4	0.969	21	19 27 33.28	2.1255	17 11 25.5	3.425
22	17 44 19.33	2.2602	18 15 12.5	0.869	22	19 29 40.72	2.1223	17 7 57.6	3.505
23	17 46 34.87	2.2579	18 16 1.7	0.769	23	19 31 47.96	2.1191	17 4 24.9	3.584
24	17 48 50.28	2.2557	S. 18 16 44.8	0.669	24	19 33 55.01	2.1159	S. 17 0 47.5	3.663



## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 5.					SATURDAY 7.				
0	19 33 55.01	2.1159	S. 17 0 47.5	3.663	0	21 11 58.80	1.9765	S. 12 44 15.5	6.818
1	19 36 1.87	2.1128	16 57 5.3	3.742	1	21 13 57.32	1.9741	12 37 24.9	6.870
2	19 38 8.54	2.1096	16 53 18.5	3.820	2	21 15 55.69	1.9718	12 30 31.1	6.923
3	19 40 15.02	2.1063	16 49 26.9	3.898	3	21 17 53.93	1.9695	12 23 34.2	6.974
4	19 42 21.30	2.1032	16 45 30.8	3.974	4	21 19 52.03	1.9672	12 16 34.2	7.025
5	19 44 27.40	2.1001	16 41 30.0	4.051	5	21 21 49.99	1.9649	12 9 31.2	7.075
6	19 46 33.31	2.0968	16 37 24.7	4.126	6	21 23 47.82	1.9627	12 2 25.2	7.125
7	19 48 39.02	2.0937	16 33 14.9	4.201	7	21 25 45.52	1.9605	11 55 16.2	7.175
8	19 50 44.55	2.0906	16 29 0.6	4.276	8	21 27 43.08	1.9583	11 48 4.2	7.224
9	19 52 49.89	2.0874	16 24 41.8	4.350	9	21 29 40.52	1.9562	11 40 49.3	7.272
10	19 54 55.04	2.0843	16 20 18.6	4.423	10	21 31 37.83	1.9542	11 33 31.6	7.320
11	19 57 0.00	2.0811	16 15 51.0	4.497	11	21 33 35.02	1.9522	11 26 10.9	7.368
12	19 59 4.77	2.0779	16 11 19.0	4.569	12	21 35 32.09	1.9502	11 18 47.4	7.415
13	20 1 9.35	2.0748	16 6 42.7	4.641	13	21 37 29.04	1.9482	11 11 21.1	7.461
14	20 3 13.75	2.0718	16 2 2.1	4.714	14	21 39 25.87	1.9462	11 3 52.1	7.507
15	20 5 17.97	2.0687	15 57 17.2	4.783	15	21 41 22.58	1.9443	10 56 20.3	7.553
16	20 7 21.99	2.0655	15 52 28.1	4.853	16	21 43 19.18	1.9424	10 48 45.8	7.598
17	20 9 25.83	2.0625	15 47 34.8	4.923	17	21 45 15.67	1.9406	10 41 8.6	7.642
18	20 11 29.49	2.0595	15 42 37.3	4.993	18	21 47 12.05	1.9388	10 33 28.8	7.685
19	20 13 32.97	2.0564	15 37 35.7	5.062	19	21 49 8.32	1.9370	10 25 46.4	7.729
20	20 15 36.26	2.0533	15 32 29.9	5.130	20	21 51 4.49	1.9353	10 18 1.3	7.772
21	20 17 39.37	2.0503	15 27 20.1	5.197	21	21 53 0.55	1.9335	10 10 13.7	7.814
22	20 19 42.30	2.0473	15 22 6.3	5.264	22	21 54 56.51	1.9318	10 2 23.6	7.856
23	20 21 45.05	2.0443	S. 15 16 48.4	5.331	23	21 56 52.37	1.9302	S. 9 54 31.0	7.897
FRIDAY 6.					SUNDAY 8.				
0	20 23 47.62	2.0413	S. 15 11 26.6	5.397	0	21 58 48.14	1.9287	S. 9 46 35.9	7.938
1	20 25 50.01	2.0384	15 6 0.8	5.462	1	22 0 43.81	1.9271	9 38 38.4	7.979
2	20 27 52.23	2.0355	15 0 31.2	5.527	2	22 2 39.39	1.9256	9 30 38.4	8.019
3	20 29 54.27	2.0325	14 54 57.6	5.591	3	22 4 34.88	1.9242	9 22 36.1	8.058
4	20 31 56.13	2.0296	14 49 20.3	5.654	4	22 6 30.29	1.9228	9 14 31.4	8.098
5	20 33 57.82	2.0268	14 43 39.1	5.718	5	22 8 25.61	1.9213	9 6 24.4	8.136
6	20 35 59.34	2.0239	14 37 54.1	5.781	6	22 10 20.84	1.9199	8 58 15.1	8.174
7	20 38 0.69	2.0211	14 32 5.4	5.843	7	22 12 16.00	1.9187	8 50 3.5	8.212
8	20 40 1.87	2.0183	14 26 13.0	5.904	8	22 14 11.08	1.9173	8 41 49.7	8.248
9	20 42 2.88	2.0154	14 20 16.9	5.966	9	22 16 6.08	1.9161	8 33 33.7	8.285
10	20 44 3.72	2.0127	14 14 17.1	6.026	10	22 18 1.01	1.9149	8 25 15.5	8.321
11	20 46 4.40	2.0099	14 8 13.8	6.086	11	22 19 55.87	1.9138	8 16 55.2	8.357
12	20 48 4.91	2.0072	14 2 6.8	6.146	12	22 21 50.66	1.9127	8 8 32.7	8.392
13	20 50 5.26	2.0045	13 55 56.3	6.204	13	22 23 45.39	1.9116	8 0 8.2	8.426
14	20 52 5.45	2.0018	13 49 42.3	6.263	14	22 25 40.05	1.9105	7 51 41.6	8.460
15	20 54 5.48	1.9992	13 43 24.8	6.321	15	22 27 34.65	1.9096	7 43 13.0	8.493
16	20 56 5.35	1.9965	13 37 3.8	6.378	16	22 29 29.20	1.9087	7 34 42.4	8.527
17	20 58 5.06	1.9939	13 30 39.4	6.435	17	22 31 23.69	1.9077	7 26 9.8	8.559
18	21 0 4.62	1.9913	13 24 11.6	6.491	18	22 33 18.12	1.9068	7 17 35.3	8.591
19	21 2 4.02	1.9888	13 17 40.5	6.547	19	22 35 12.51	1.9061	7 8 58.9	8.623
20	21 4 3.28	1.9863	13 11 6.0	6.603	20	22 37 6.85	1.9053	7 0 20.6	8.654
21	21 6 2.38	1.9838	13 4 28.2	6.657	21	22 39 1.14	1.9045	6 51 40.4	8.684
22	21 8 1.33	1.9813	12 57 47.2	6.710	22	22 40 55.39	1.9038	6 42 58.5	8.714
23	21 10 0.14	1.9789	12 51 3.0	6.764	23	22 42 49.60	1.9032	6 34 14.7	8.744
24	21 11 58.80	1.9765	S. 12 44 15.5	6.818	24	22 44 43.77	1.9026	S. 6 25 29.2	8.773

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 9.					WEDNESDAY 11.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	22 44 43.77	1.5026	S. 6 25 29.2	8.773	0	0 16 11.37	1.9254	N. 0 59 20.4	9.555
1	22 46 37.91	1.9020	6 16 42.0	8.801	1	0 18 6.94	1.9270	1 8 53.8	9.557
2	22 48 32.01	1.9015	6 7 53.1	8.829	2	0 20 2.61	1.9287	1 18 27.3	9.559
3	22 50 26.09	1.9010	5 59 2.5	8.857	3	0 21 58.38	1.9303	1 28 0.9	9.561
4	22 52 20.13	1.9006	5 50 10.2	8.884	4	0 23 54.25	1.9320	1 37 34.6	9.562
5	22 54 14.16	1.9002	5 41 16.4	8.910	5	0 25 50.22	1.9338	1 47 8.3	9.562
6	22 56 8.16	1.8998	5 32 21.0	8.937	6	0 27 46.30	1.9356	1 56 42.0	9.562
7	22 58 2.14	1.8995	5 23 24.0	8.963	7	0 29 42.49	1.9374	2 6 15.7	9.560
8	22 59 56.10	1.8993	5 14 25.5	8.988	8	0 31 38.79	1.9393	2 15 49.2	9.558
9	23 1 50.05	1.8990	5 5 25.5	9.012	9	0 33 35.20	1.9412	2 25 22.6	9.556
10	23 3 43.98	1.8988	4 56 24.1	9.035	10	0 35 31.73	1.9432	2 34 55.9	9.552
11	23 5 37.91	1.8988	4 47 21.3	9.059	11	0 37 28.38	1.9452	2 44 28.9	9.548
12	23 7 31.83	1.8987	4 38 17.0	9.082	12	0 39 25.15	1.9473	2 54 1.7	9.544
13	23 9 25.75	1.8987	4 29 11.4	9.105	13	0 41 22.05	1.9493	3 3 34.2	9.539
14	23 11 19.67	1.8987	4 20 4.4	9.127	14	0 43 19.07	1.9514	3 13 6.4	9.533
15	23 13 13.59	1.8987	4 10 56.1	9.148	15	0 45 16.22	1.9537	3 22 38.2	9.527
16	23 15 7.51	1.8988	4 1 46.6	9.169	16	0 47 13.51	1.9559	3 32 9.6	9.520
17	23 17 1.44	1.8989	3 52 35.8	9.190	17	0 49 10.93	1.9582	3 41 40.6	9.513
18	23 18 55.38	1.8991	3 43 23.8	9.210	18	0 51 8.49	1.9604	3 51 11.1	9.504
19	23 20 49.33	1.8993	3 34 10.6	9.229	19	0 53 6.18	1.9628	4 0 41.1	9.495
20	23 22 43.29	1.8996	3 24 56.3	9.248	20	0 55 4.02	1.9653	4 10 10.5	9.485
21	23 24 37.28	1.8999	3 15 40.8	9.267	21	0 57 2.01	1.9677	4 19 39.3	9.474
22	23 26 31.28	1.9003	3 6 24.3	9.284	22	0 59 0.14	1.9702	4 29 7.4	9.463
23	23 28 25.31	1.9007	S. 2 57 6.7	9.302	23	1 0 58.43	1.9727	N. 4 38 34.8	9.451
TUESDAY 10.					THURSDAY 12.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	23 30 19.36	1.9011	S. 2 47 48.1	9.318	0	1 2 56.86	1.9752	N. 4 48 1.5	9.438
1	23 32 13.44	1.9016	2 38 28.5	9.335	1	1 4 55.45	1.9777	4 57 27.4	9.425
2	23 34 7.55	1.9022	2 29 7.9	9.350	2	1 6 54.19	1.9803	5 6 52.5	9.411
3	23 36 1.70	1.9027	2 19 46.5	9.365	3	1 8 53.09	1.9831	5 16 16.7	9.396
4	23 37 55.88	1.9033	2 10 24.1	9.381	4	1 10 52.16	1.9858	5 25 40.0	9.381
5	23 39 50.10	1.9041	2 1 0.8	9.395	5	1 12 51.39	1.9886	5 35 2.4	9.365
6	23 41 44.37	1.9048	1 51 36.7	9.408	6	1 14 50.79	1.9914	5 44 23.8	9.347
7	23 43 38.68	1.9055	1 42 11.9	9.421	7	1 16 50.36	1.9943	5 53 44.1	9.329
8	23 45 33.03	1.9063	1 32 46.2	9.433	8	1 18 50.10	1.9971	6 3 3.3	9.311
9	23 47 27.44	1.9073	1 23 19.9	9.445	9	1 20 50.01	1.9999	6 12 21.4	9.292
10	23 49 21.90	1.9082	1 13 52.8	9.457	10	1 22 50.09	2.0029	6 21 38.3	9.272
11	23 51 16.42	1.9091	1 4 25.1	9.468	11	1 24 50.36	2.0059	6 30 54.0	9.251
12	23 53 10.99	1.9100	0 54 56.7	9.478	12	1 26 50.80	2.0088	6 40 8.4	9.229
13	23 55 5.62	1.9111	0 45 27.7	9.488	13	1 28 51.42	2.0119	6 49 21.5	9.207
14	23 57 0.32	1.9122	0 35 58.2	9.497	14	1 30 52.23	2.0151	6 58 33.3	9.184
15	23 58 55.08	1.9133	0 26 28.1	9.506	15	1 32 53.23	2.0182	7 7 43.6	9.159
16	0 0 49.91	1.9144	0 16 57.5	9.513	16	1 34 54.41	2.0213	7 16 52.4	9.135
17	0 2 44.81	1.9157	S. 0 7 26.5	9.520	17	1 36 55.79	2.0246	7 25 59.8	9.110
18	0 4 39.79	1.9170	N. 0 2 4.9	9.527	18	1 38 57.36	2.0278	7 35 5.6	9.083
19	0 6 34.85	1.9183	0 11 36.7	9.533	19	1 40 59.12	2.0310	7 44 9.8	9.057
20	0 8 29.98	1.9196	0 21 8.9	9.539	20	1 43 1.08	2.0343	7 53 12.4	9.029
21	0 10 25.20	1.9210	0 30 41.4	9.544	21	1 45 3.24	2.0377	8 2 13.3	9.000
22	0 12 20.50	1.9224	0 40 14.2	9.548	22	1 47 5.60	2.0410	8 11 12.4	8.970
23	0 14 15.89	1.9239	0 49 47.2	9.552	23	1 49 8.16	2.0444	8 20 9.7	8.939
24	0 16 11.37	1.9254	N. 0 59 20.4	9.555	24	1 51 10.93	2.0478	N. 8 29 5.1	8.908

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 13.					SUNDAY 15.				
0	1 51 10.93	2.0478	N. 8 29 5.1	8.908	0	3 33 51.49	2.2354	N. 14 44 8.6	6.372
1	1 53 13.90	2.0513	8 37 58.6	8.876	1	3 36 5.74	2.2395	14 50 28.7	6.297
2	1 55 17.08	2.0548	8 46 50.2	8.843	2	3 38 20.23	2.2435	14 56 44.2	6.220
3	1 57 20.48	2.0583	8 55 39.8	8.810	3	3 40 34.96	2.2475	15 2 55.1	6.143
4	1 59 24.08	2.0618	9 4 27.4	8.775	4	3 42 49.93	2.2515	15 9 1.4	6.065
5	2 1 27.89	2.0654	9 13 12.8	8.739	5	3 45 5.14	2.2555	15 15 2.9	5.987
6	2 3 31.93	2.0691	9 21 56.1	8.703	6	3 47 20.59	2.2594	15 20 59.8	5.908
7	2 5 36.18	2.0726	9 30 37.2	8.666	7	3 49 36.27	2.2634	15 26 51.8	5.826
8	2 7 40.64	2.0763	9 39 16.0	8.628	8	3 51 52.20	2.2674	15 32 38.9	5.744
9	2 9 45.33	2.0800	9 47 52.6	8.590	9	3 54 8.36	2.2713	15 38 21.1	5.662
10	2 11 50.24	2.0837	9 56 26.8	8.550	10	3 56 24.75	2.2752	15 43 58.4	5.580
11	2 13 55.37	2.0874	10 4 58.6	8.509	11	3 58 41.38	2.2791	15 49 30.7	5.496
12	2 16 0.73	2.0912	10 13 27.9	8.468	12	4 0 58.24	2.2829	15 54 57.9	5.411
13	2 18 6.31	2.0949	10 21 54.7	8.426	13	4 3 15.33	2.2868	16 0 20.0	5.325
14	2 20 12.12	2.0987	10 30 19.0	8.383	14	4 5 32.65	2.2906	16 5 36.9	5.238
15	2 22 18.15	2.1025	10 38 40.6	8.338	15	4 7 50.20	2.2943	16 10 48.6	5.151
16	2 24 24.42	2.1064	10 46 59.6	8.293	16	4 10 7.97	2.2981	16 15 55.0	5.063
17	2 26 30.92	2.1103	10 55 15.8	8.247	17	4 12 25.97	2.3018	16 20 56.1	4.974
18	2 28 37.65	2.1141	11 3 29.2	8.200	18	4 14 44.19	2.3055	16 25 51.9	4.884
19	2 30 44.61	2.1180	11 11 39.8	8.153	19	4 17 2.63	2.3092	16 30 42.2	4.793
20	2 32 51.81	2.1219	11 19 47.6	8.105	20	4 19 21.29	2.3128	16 35 27.1	4.702
21	2 34 59.24	2.1258	11 27 52.4	8.055	21	4 21 40.17	2.3164	16 40 6.4	4.609
22	2 37 6.91	2.1298	11 35 54.2	8.004	22	4 23 59.26	2.3200	16 44 40.2	4.516
23	2 39 14.82	2.1338	N. 11 43 52.9	7.953	23	4 26 18.57	2.3235	N. 16 49 8.3	4.422
SATURDAY 14.					MONDAY 16.				
0	2 41 22.97	2.1378	N. 11 51 48.5	7.901	0	4 28 38.08	2.3269	N. 16 53 30.8	4.328
1	2 43 31.36	2.1418	11 59 41.0	7.848	1	4 30 57.80	2.3304	16 57 47.6	4.233
2	2 45 39.98	2.1458	12 7 30.2	7.793	2	4 33 17.73	2.3338	17 1 58.7	4.136
3	2 47 48.85	2.1498	12 15 16.2	7.739	3	4 35 37.86	2.3372	17 6 3.9	4.038
4	2 49 57.96	2.1538	12 22 58.9	7.683	4	4 37 58.20	2.3406	17 10 3.3	3.942
5	2 52 7.31	2.1579	12 30 38.1	7.626	5	4 40 18.73	2.3438	17 13 56.9	3.844
6	2 54 16.91	2.1620	12 38 14.0	7.569	6	4 42 39.46	2.3471	17 17 44.6	3.744
7	2 56 26.75	2.1660	12 45 46.4	7.510	7	4 45 0.38	2.3503	17 21 26.2	3.644
8	2 58 36.83	2.1701	12 53 15.2	7.450	8	4 47 21.49	2.3534	17 25 1.9	3.544
9	3 0 47.16	2.1742	13 0 40.4	7.389	9	4 49 42.79	2.3566	17 28 31.5	3.443
10	3 2 57.73	2.1783	13 8 1.9	7.328	10	4 52 4.28	2.3596	17 31 55.1	3.342
11	3 5 8.55	2.1823	13 15 19.7	7.266	11	4 54 25.94	2.3626	17 35 12.5	3.239
12	3 7 19.61	2.1864	13 22 33.8	7.202	12	4 56 47.79	2.3656	17 38 23.8	3.137
13	3 9 30.92	2.1905	13 29 44.0	7.138	13	4 59 9.81	2.3685	17 41 28.9	3.033
14	3 11 42.47	2.1946	13 36 50.4	7.074	14	5 1 32.01	2.3714	17 44 27.7	2.928
15	3 13 54.27	2.1987	13 43 52.9	7.008	15	5 3 54.38	2.3743	17 47 20.3	2.823
16	3 16 6.31	2.2028	13 50 51.3	6.940	16	5 6 16.92	2.3770	17 50 6.5	2.718
17	3 18 18.60	2.2069	13 57 45.7	6.872	17	5 8 39.62	2.3797	17 52 46.4	2.613
18	3 20 31.14	2.2110	14 4 36.0	6.803	18	5 11 2.48	2.3823	17 55 20.0	2.506
19	3 22 43.92	2.2150	14 11 22.1	6.734	19	5 13 25.49	2.3848	17 57 47.1	2.398
20	3 24 56.94	2.2191	14 18 4.1	6.664	20	5 15 48.66	2.3874	18 0 7.8	2.291
21	3 27 10.21	2.2232	14 24 41.8	6.592	21	5 18 11.98	2.3899	18 2 22.0	2.183
22	3 29 23.73	2.2273	14 31 15.1	6.519	22	5 20 35.45	2.3923	18 4 29.7	2.074
23	3 31 37.49	2.2313	14 37 44.1	6.446	23	5 22 59.06	2.3947	18 6 30.9	1.965
24	3 33 51.49	2.2354	N. 14 44 8.6	6.372	24	5 25 22.81	2.3970	N. 18 8 25.5	1.855

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 17.					THURSDAY 19.				
0	h m s	s	N. 18 8 25.5	1.855	0	h m s	s	N. 17 26 23.5	3.621
1	5 27 22.81	2.3970	18 10 13.5	1.745	1	7 21 51.57	2.4312	17 22 42.9	3.732
2	5 27 46.70	2.3993	18 11 54.9	1.634	2	7 24 17.42	2.4304	17 18 55.6	3.843
3	5 30 10.72	2.4014	18 13 29.6	1.523	3	7 26 43.22	2.4295	17 15 1.7	3.953
4	5 32 34.87	2.4035	18 14 57.7	1.412	4	7 29 8.96	2.4285	17 11 1.2	4.063
5	5 34 59.14	2.4056	18 16 19.1	1.301	5	7 31 34.64	2.4276	17 6 54.1	4.173
6	5 37 23.54	2.4076	18 17 33.8	1.189	6	7 34 0.27	2.4266	17 2 40.4	4.282
7	5 39 48.05	2.4095	18 18 41.8	1.077	7	7 36 25.83	2.4254	16 58 20.2	4.391
8	5 42 12.68	2.4114	18 19 43.0	0.963	8	7 38 51.32	2.4243	16 53 53.5	4.499
9	5 44 37.42	2.4132	18 20 37.4	0.851	9	7 41 16.74	2.4231	16 49 20.3	4.607
10	5 47 2.26	2.4149	18 21 25.1	0.738	10	7 43 42.09	2.4218	16 44 40.6	4.715
11	5 49 27.21	2.4166	18 22 5.9	0.623	11	7 46 7.36	2.4205	16 39 54.5	4.822
12	5 51 52.25	2.4182	18 22 39.9	0.510	12	7 48 32.55	2.4192	16 35 2.0	4.928
13	5 54 17.39	2.4198	18 23 7.1	0.396	13	7 50 57.66	2.4178	16 30 3.2	5.033
14	5 56 42.62	2.4212	18 23 27.4	0.281	14	7 53 22.69	2.4164	16 24 58.1	5.138
15	5 59 7.93	2.4226	18 23 40.8	0.166	15	7 55 47.63	2.4149	16 19 46.7	5.242
16	6 1 33.33	2.4240	18 23 47.3	+ 0.051	16	7 58 12.48	2.4134	16 14 29.1	5.346
17	6 3 58.81	2.4253	18 23 46.9	- 0.063	17	8 0 37.24	2.4118	16 9 5.2	5.449
18	6 6 24.36	2.4264	18 23 39.7	0.178	18	8 3 1.90	2.4103	16 3 35.2	5.552
19	6 8 49.98	2.4276	18 23 25.5	0.294	19	8 5 26.47	2.4087	15 57 59.0	5.653
20	6 11 15.67	2.4287	18 23 4.4	0.409	20	8 7 50.94	2.4070	15 52 16.8	5.754
21	6 13 41.42	2.4297	18 22 36.4	0.525	21	8 10 15.31	2.4053	15 46 28.5	5.855
22	6 16 7.23	2.4306	18 22 1.4	0.641	22	8 12 39.58	2.4036	15 40 34.2	5.955
23	6 18 33.09	2.4315	N. 18 21 19.5	0.757	23	8 15 3.74	2.4018	N. 15 34 33.9	6.054
24	6 20 59.01	2.4323				8 17 27.80	2.4000		
WEDNESDAY 18.					FRIDAY 20.				
0	6 23 24.97	2.4330	N. 18 20 30.6	0.873	0	8 19 51.74	2.3982	N. 15 28 27.7	6.152
1	6 25 50.97	2.4337	18 19 34.8	0.988	1	8 22 15.58	2.3963	15 22 15.6	6.249
2	6 28 17.01	2.4343	18 18 32.1	1.103	2	8 24 39.30	2.3944	15 15 57.8	6.346
3	6 30 43.09	2.4348	18 17 22.4	1.219	3	8 27 2.91	2.3926	15 9 34.1	6.443
4	6 33 9.19	2.4353	18 16 5.8	1.335	4	8 29 26.41	2.3907	15 3 4.6	6.538
5	6 35 35.32	2.4357	18 14 42.2	1.452	5	8 31 49.79	2.3887	14 56 29.5	6.633
6	6 38 1.47	2.4360	18 13 11.6	1.568	6	8 34 13.05	2.3867	14 49 48.7	6.727
7	6 40 27.64	2.4363	18 11 34.1	1.683	7	8 36 36.19	2.3847	14 43 2.3	6.819
8	6 42 53.83	2.4365	18 9 49.7	1.798	8	8 38 59.21	2.3826	14 36 10.4	6.912
9	6 45 20.02	2.4366	18 7 58.4	1.913	9	8 41 22.10	2.3806	14 29 12.9	7.003
10	6 47 46.22	2.4367	18 6 0.1	2.028	10	8 43 44.88	2.3786	14 22 10.0	7.093
11	6 50 12.43	2.4368	18 3 54.9	2.144	11	8 46 7.53	2.3764	14 15 1.7	7.183
12	6 52 38.63	2.4367	18 1 42.8	2.259	12	8 48 30.05	2.3743	14 7 48.0	7.273
13	6 55 4.83	2.4365	17 59 23.8	2.374	13	8 50 52.45	2.3722	14 0 29.0	7.361
14	6 57 31.01	2.4363	17 56 57.9	2.489	14	8 53 14.72	2.3701	13 53 4.7	7.448
15	6 59 57.19	2.4361	17 54 25.1	2.603	15	8 55 36.86	2.3679	13 45 35.2	7.534
16	7 2 23.34	2.4358	17 51 45.5	2.717	16	8 57 58.87	2.3658	13 38 0.6	7.619
17	7 4 49.48	2.4355	17 48 59.1	2.831	17	9 0 20.76	2.3637	13 30 20.9	7.704
18	7 7 15.60	2.4350	17 46 5.8	2.945	18	9 2 42.51	2.3614	13 22 36.1	7.788
19	7 9 41.68	2.4344	17 43 5.7	3.058	19	9 5 4.13	2.3592	13 14 46.4	7.870
20	7 12 7.73	2.4339	17 39 58.8	3.172	20	9 7 25.62	2.3571	13 6 51.7	7.952
21	7 14 33.75	2.4333	17 36 45.1	3.285	21	9 9 46.98	2.3549	12 58 52.1	8.033
22	7 16 59.73	2.4327	17 33 24.6	3.397	22	9 12 8.21	2.3527	12 50 47.7	8.113
23	7 19 25.67	2.4320	17 29 57.4	3.509	23	9 14 29.30	2.3504	12 42 38.5	8.193
24	7 21 51.57	2.4312	N. 17 26 23.5	3.621	24	9 16 50.26	2.3482	N. 12 34 24.6	8.271

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 21.					MONDAY 23.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	9 16 50.26	2.3482	N. 12 34 24.6	8.271	0	11 7 12.29	2.2582	N. 4 46 26.5	10.823
1	9 19 11.09	2.3461	12 26 6.0	8.348	1	11 9 27.74	2.2569	4 35 36.3	10.850
2	9 21 31.79	2.3439	12 17 42.8	8.424	2	11 11 43.12	2.2557	4 24 44.5	10.877
3	9 23 52.36	2.3417	12 9 15.1	8.499	3	11 13 58.42	2.2545	4 13 51.1	10.902
4	9 26 12.79	2.3394	12 0 42.9	8.574	4	11 16 13.66	2.2533	4 2 56.3	10.924
5	9 28 33.09	2.3373	11 52 6.2	8.648	5	11 18 28.82	2.2522	3 52 0.2	10.946
6	9 30 53.26	2.3351	11 43 25.2	8.720	6	11 20 43.92	2.2512	3 41 2.8	10.968
7	9 33 13.30	2.3329	11 34 39.8	8.792	7	11 22 58.96	2.2502	3 30 4.0	10.989
8	9 35 33.21	2.3307	11 25 50.2	8.862	8	11 25 13.94	2.2492	3 19 4.1	11.008
9	9 37 52.98	2.3284	11 16 56.4	8.931	9	11 27 28.86	2.2482	3 8 3.1	11.025
10	9 40 12.62	2.3263	11 7 58.5	8.999	10	11 29 43.72	2.2472	2 57 1.1	11.042
11	9 42 32.14	2.3242	10 58 56.5	9.067	11	11 31 58.52	2.2463	2 45 58.1	11.058
12	9 44 51.52	2.3220	10 49 50.5	9.133	12	11 34 13.27	2.2454	2 34 54.1	11.073
13	9 47 10.78	2.3198	10 40 40.5	9.198	13	11 36 27.97	2.2446	2 23 49.3	11.086
14	9 49 29.90	2.3177	10 31 26.7	9.263	14	11 38 42.62	2.2436	2 12 43.8	11.098
15	9 51 48.90	2.3157	10 22 9.0	9.327	15	11 40 57.23	2.2431	2 1 37.5	11.110
16	9 54 7.78	2.3136	10 12 47.5	9.389	16	11 43 11.79	2.2423	1 50 30.6	11.120
17	9 56 26.53	2.3114	10 3 22.3	9.450	17	11 45 26.31	2.2417	1 39 23.1	11.129
18	9 58 45.15	2.3093	9 53 53.5	9.510	18	11 47 40.79	2.2410	1 28 15.1	11.138
19	10 1 3.65	2.3073	9 44 21.1	9.570	19	11 49 55.23	2.2404	1 17 6.6	11.144
20	10 3 22.03	2.3053	9 34 45.1	9.628	20	11 52 9.64	2.2399	1 5 57.8	11.149
21	10 5 40.29	2.3033	9 25 5.7	9.685	21	11 54 24.02	2.2393	0 54 48.7	11.153
22	10 7 58.42	2.3013	9 15 22.9	9.742	22	11 56 38.36	2.2388	0 43 39.4	11.157
23	10 10 16.44	2.2993	N. 9 5 36.7	9.797	23	11 58 52.68	2.2384	N. 0 32 29.8	11.160
SUNDAY 22.					TUESDAY 24.				
0	10 12 34.34	2.2973	N. 8 55 47.3	9.850	0	12 1 6.97	2.2379	N. 0 21 20.2	11.161
1	10 14 52.12	2.2954	8 45 54.7	9.903	1	12 3 21.23	2.2376	N. 0 10 10.5	11.161
2	10 17 9.79	2.2935	8 35 58.9	9.956	2	12 5 35.48	2.2372	S. 0 0 59.1	11.160
3	10 19 27.34	2.2916	8 26 0.0	10.007	3	12 7 49.70	2.2368	0 12 8.7	11.158
4	10 21 44.78	2.2897	8 15 58.1	10.056	4	12 10 3.90	2.2366	0 23 18.1	11.154
5	10 24 2.10	2.2878	8 5 53.3	10.105	5	12 12 18.09	2.2364	0 34 27.2	11.150
6	10 26 19.32	2.2861	7 55 45.5	10.152	6	12 14 32.27	2.2362	0 45 36.1	11.145
7	10 28 36.43	2.2843	7 45 35.0	10.198	7	12 16 46.43	2.2360	0 56 44.6	11.138
8	10 30 53.43	2.2825	7 35 21.7	10.244	8	12 19 0.59	2.2359	1 7 52.7	11.131
9	10 33 10.33	2.2808	7 25 5.7	10.289	9	12 21 14.74	2.2358	1 19 0.3	11.122
10	10 35 27.12	2.2790	7 14 47.0	10.333	10	12 23 28.89	2.2358	1 30 7.3	11.112
11	10 37 43.81	2.2773	7 4 25.8	10.374	11	12 25 43.03	2.2357	1 41 13.7	11.101
12	10 40 0.40	2.2757	6 54 2.1	10.415	12	12 27 57.17	2.2357	1 52 19.4	11.089
13	10 42 16.89	2.2740	6 43 36.0	10.455	13	12 30 11.31	2.2358	2 3 24.4	11.076
14	10 44 33.28	2.2724	6 33 7.5	10.494	14	12 32 25.46	2.2358	2 14 28.5	11.061
15	10 46 49.58	2.2709	6 22 36.7	10.533	15	12 34 39.61	2.2359	2 25 31.7	11.046
16	10 49 5.79	2.2693	6 12 3.6	10.569	16	12 36 53.77	2.2360	2 36 34.0	11.029
17	10 51 21.90	2.2678	6 1 28.4	10.605	17	12 39 7.93	2.2362	2 47 35.2	11.012
18	10 53 37.92	2.2663	5 50 51.0	10.640	18	12 41 22.11	2.2364	2 58 35.4	10.993
19	10 55 53.86	2.2649	5 40 11.6	10.673	19	12 43 36.30	2.2367	3 9 34.4	10.973
20	10 58 9.71	2.2635	5 29 30.3	10.704	20	12 45 50.51	2.2369	3 20 32.1	10.952
21	11 0 25.48	2.2621	5 18 47.1	10.736	21	12 48 4.73	2.2372	3 31 28.6	10.931
22	11 2 41.16	2.2607	5 8 2.0	10.767	22	12 50 18.97	2.2376	3 42 23.8	10.908
23	11 4 56.76	2.2594	4 57 15.1	10.796	23	12 52 33.24	2.2379	3 53 17.5	10.883
24	11 7 12.29	2.2582	N. 4 46 26.5	10.823	24	12 54 47.52	2.2383	S. 4 4 9.7	10.858

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 25.					FRIDAY 27.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	12 54 47.52	2.2383	S. 4 4 9.7	10.858	0	14 43 5.64	2.2794	S. 11 56 11.7	8.428
1	12 57 1.83	2.2387	4 15 0.4	10.831	1	14 45 22.44	2.2805	12 4 35.2	8.354
2	12 59 16.16	2.2391	4 25 49.4	10.803	2	14 47 39.30	2.2814	12 12 54.2	8.279
3	13 1 30.52	2.2396	4 36 36.8	10.775	3	14 49 56.21	2.2824	12 21 8.7	8.204
4	13 3 44.91	2.2401	4 47 22.4	10.745	4	14 52 13.19	2.2835	12 29 18.7	8.128
5	13 5 59.33	2.2406	4 58 6.2	10.715	5	14 54 30.23	2.2845	12 37 24.1	8.051
6	13 8 13.78	2.2412	5 8 48.2	10.683	6	14 56 47.33	2.2854	12 45 24.8	7.973
7	13 10 28.27	2.2417	5 19 28.2	10.650	7	14 59 4.48	2.2863	12 53 20.8	7.894
8	13 12 42.79	2.2423	5 30 6.2	10.616	8	15 1 21.69	2.2873	13 1 12.1	7.815
9	13 14 57.35	2.2430	5 40 42.1	10.581	9	15 3 38.96	2.2883	13 8 58.6	7.735
10	13 17 11.95	2.2437	5 51 15.9	10.545	10	15 5 56.29	2.2893	13 16 40.3	7.654
11	13 19 26.59	2.2443	6 1 47.5	10.508	11	15 8 13.67	2.2901	13 24 17.1	7.573
12	13 21 41.27	2.2450	6 12 16.8	10.469	12	15 10 31.10	2.2910	13 31 49.0	7.490
13	13 23 55.99	2.2457	6 22 43.8	10.430	13	15 12 48.59	2.2918	13 39 15.9	7.407
14	13 26 10.76	2.2465	6 33 8.4	10.390	14	15 15 6.12	2.2926	13 46 37.8	7.323
15	13 28 25.57	2.2473	6 43 30.6	10.349	15	15 17 23.70	2.2935	13 53 54.7	7.239
16	13 30 40.43	2.2481	6 53 50.3	10.306	16	15 19 41.34	2.2943	14 1 6.5	7.154
17	13 32 55.34	2.2488	7 4 7.3	10.262	17	15 21 59.02	2.2951	14 8 13.2	7.068
18	13 35 10.29	2.2497	7 14 21.7	10.218	18	15 24 16.75	2.2958	14 15 14.7	6.981
19	13 37 25.30	2.2505	7 24 33.5	10.173	19	15 26 34.52	2.2965	14 22 10.9	6.893
20	13 39 40.35	2.2513	7 34 42.5	10.126	20	15 28 52.33	2.2972	14 29 1.9	6.807
21	13 41 55.46	2.2522	7 44 48.6	10.078	21	15 31 10.18	2.2979	14 35 47.7	6.718
22	13 44 10.62	2.2532	7 54 51.9	10.030	22	15 33 28.08	2.2986	14 42 28.1	6.629
23	13 46 25.84	2.2541	S. 8 4 52.2	9.980	23	15 35 46.01	2.2992	S. 14 49 3.2	6.539
THURSDAY 26.					SATURDAY 28.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	13 48 41.11	2.2550	S. 8 14 49.5	9.929	0	15 38 3.98	2.2998	S. 14 55 32.8	6.448
1	13 50 56.44	2.2559	8 24 43.7	9.878	1	15 40 21.98	2.3003	15 1 57.0	6.358
2	13 53 11.82	2.2568	8 34 34.9	9.826	2	15 42 40.02	2.3009	15 8 15.8	6.267
3	13 55 27.26	2.2578	8 44 22.8	9.772	3	15 44 58.09	2.3014	15 14 29.0	6.174
4	13 57 42.76	2.2588	8 54 7.5	9.718	4	15 47 16.19	2.3019	15 20 36.7	6.082
5	13 59 58.32	2.2598	9 3 48.9	9.662	5	15 49 34.32	2.3023	15 26 38.9	5.989
6	14 2 13.94	2.2608	9 13 26.9	9.605	6	15 51 52.47	2.3028	15 32 35.4	5.895
7	14 4 29.62	2.2618	9 23 1.5	9.548	7	15 54 10.65	2.3032	15 38 26.3	5.802
8	14 6 45.36	2.2628	9 32 32.6	9.489	8	15 56 28.85	2.3035	15 44 11.6	5.708
9	14 9 1.16	2.2638	9 42 0.2	9.430	9	15 58 47.07	2.3038	15 49 51.2	5.612
10	14 11 17.02	2.2648	9 51 24.2	9.370	10	16 1 5.31	2.3041	15 55 25.0	5.516
11	14 13 32.94	2.2659	10 0 44.6	9.308	11	16 3 23.56	2.3043	16 0 53.1	5.421
12	14 15 48.93	2.2670	10 10 1.2	9.246	12	16 5 41.83	2.3046	16 6 15.5	5.325
13	14 18 4.98	2.2680	10 19 14.1	9.183	13	16 8 0.11	2.3047	16 11 32.1	5.228
14	14 20 21.09	2.2690	10 28 23.1	9.118	14	16 10 18.40	2.3048	16 16 42.8	5.130
15	14 22 37.26	2.2701	10 37 28.3	9.053	15	16 12 36.69	2.3048	16 21 47.7	5.033
16	14 24 53.50	2.2712	10 46 29.5	8.988	16	16 14 54.98	2.3049	16 26 46.8	4.935
17	14 27 9.80	2.2722	10 55 26.8	8.922	17	16 17 13.28	2.3050	16 31 39.9	4.837
18	14 29 26.16	2.2733	11 4 20.1	8.853	18	16 19 31.58	2.3050	16 36 27.2	4.738
19	14 31 42.59	2.2743	11 13 9.2	8.784	19	16 21 49.88	2.3049	16 41 8.5	4.639
20	14 33 59.07	2.2753	11 21 54.2	8.715	20	16 24 8.17	2.3048	16 45 43.9	4.540
21	14 36 15.62	2.2764	11 30 35.0	8.645	21	16 26 26.45	2.3047	16 50 13.3	4.440
22	14 38 32.24	2.2774	11 39 11.6	8.573	22	16 28 44.73	2.3045	16 54 36.7	4.340
23	14 40 48.91	2.2783	11 47 43.8	8.501	23	16 31 2.99	2.3042	16 58 54.1	4.240
24	14 43 5.64	2.2794	S. 11 56 11.7	8.428	24	16 33 21.23	2.3039	S. 17 3 5.5	4.140

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 29.					TUESDAY 31.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	16 33 21.23	2.3039	S. 17 3 5.5	4.140	0	18 22 44.46	2.2364	S. 18 24 25.4	0.722
1	16 35 39.46	2.3036	17 7 10.9	4.039	1	18 24 58.57	2.2339	18 23 39.2	0.818
2	16 37 57.66	2.3032	17 11 10.2	3.938	2	18 27 12.53	2.2314	18 22 47.2	0.914
3	16 40 15.85	2.3028	17 15 3.4	3.837	3	18 29 26.34	2.2288	18 21 49.5	1.010
4	16 42 34.00	2.3023	17 18 50.6	3.736	4	18 31 39.99	2.2263	18 20 46.0	1.106
5	16 44 52.13	2.3019	17 22 31.7	3.634	5	18 33 53.49	2.2237	18 19 36.8	1.202
6	16 47 10.23	2.3013	17 26 6.7	3.533	6	18 36 6.84	2.2211	18 18 21.8	1.297
7	16 49 28.29	2.3007	17 29 35.6	3.430	7	18 38 20.02	2.2183	18 17 1.2	1.390
8	16 51 46.31	2.3000	17 32 58.3	3.328	8	18 40 33.04	2.2157	18 15 35.0	1.484
9	16 54 4.29	2.2993	17 36 15.0	3.227	9	18 42 45.90	2.2130	18 14 3.1	1.578
10	16 56 22.23	2.2987	17 39 25.5	3.123	10	18 44 58.60	2.2102	18 12 25.6	1.672
11	16 58 40.13	2.2978	17 42 29.8	3.021	11	18 47 11.13	2.2074	18 10 42.5	1.764
12	17 0 57.97	2.2970	17 45 28.0	2.919	12	18 49 23.49	2.2046	18 8 53.9	1.856
13	17 3 15.77	2.2962	17 48 20.1	2.817	13	18 51 35.68	2.2017	18 6 59.8	1.948
14	17 5 33.51	2.2952	17 51 6.0	2.713	14	18 53 47.70	2.1988	18 5 0.1	2.040
15	17 7 51.19	2.2942	17 53 45.7	2.611	15	18 55 59.54	2.1959	18 2 55.0	2.130
16	17 10 8.81	2.2932	17 56 19.3	2.508	16	18 58 11.21	2.1930	18 0 44.5	2.221
17	17 12 26.37	2.2922	17 58 46.7	2.405	17	19 0 22.70	2.1901	17 58 28.5	2.311
18	17 14 43.87	2.2911	18 1 7.9	2.303	18	19 2 34.02	2.1871	17 56 7.2	2.399
19	17 17 1.30	2.2898	18 3 23.0	2.200	19	19 4 45.15	2.1841	17 53 40.6	2.488
20	17 19 18.65	2.2886	18 5 31.9	2.098	20	19 6 56.11	2.1811	17 51 8.6	2.577
21	17 21 35.93	2.2873	18 7 34.7	1.995	21	19 9 6.88	2.1780	17 48 31.3	2.665
22	17 23 53.13	2.2861	18 9 31.3	1.892	22	19 11 17.47	2.1750	17 45 48.8	2.753
23	17 26 10.26	2.2848	S. 18 11 21.7	1.789	23	19 13 27.88	2.1719	S. 17 43 1.0	2.840
MONDAY 30.					WEDNESDAY, JUNE 1.				
0	17 28 27.30	2.2833	S. 18 13 6.0	1.687	0	19 15 38.10	2.1688	S. 17 40 8.0	2.926
1	17 30 44.26	2.2819	18 14 44.1	1.584	PHASES OF THE MOON.				
2	17 33 1.13	2.2803	18 16 16.1	1.482					
3	17 35 17.90	2.2788	18 17 42.0	1.380					
4	17 37 34.59	2.2773	18 19 1.7	1.278					
5	17 39 51.18	2.2756	18 20 15.3	1.175	<div> <div>d h m</div> <div>☾ Last Quarter . . . . . May 6 23 50.4</div> <div>● New Moon . . . . . 14 22 58.4</div> <div>☾ First Quarter . . . . . 21 22 18.7</div> <div>○ Full Moon . . . . . 28 20 54.6</div> </div>				
6	17 42 7.66	2.2739	18 21 22.7	1.073					
7	17 44 24.05	2.2722	18 22 24.1	0.972					
8	17 46 40.33	2.2704	18 23 19.4	0.871					
9	17 48 56.50	2.2687	18 24 8.6	0.769	<div> <div>d h</div> <div>☾ Apogee . . . . . May 8 4.3</div> <div>☾ Perigee . . . . . 22 10.5</div> </div>				
10	17 51 12.57	2.2668	18 24 51.7	0.668					
11	17 53 28.52	2.2648	18 25 28.7	0.567					
12	17 55 44.35	2.2629	18 25 59.7	0.467					
13	17 58 0.07	2.2610	18 26 24.7	0.366					
14	18 0 15.67	2.2589	18 26 43.6	0.265					
15	18 2 31.14	2.2568	18 26 56.5	0.166					
16	18 4 46.48	2.2547	18 27 3.5	-0.066					
17	18 7 1.70	2.2526	18 27 4.4	+0.034					
18	18 9 16.79	2.2504	18 26 59.4	0.133					
19	18 11 31.75	2.2482	18 26 48.5	0.231					
20	18 13 46.57	2.2459	18 26 31.7	0.330					
21	18 16 1.26	2.2436	18 26 8.9	0.428					
22	18 18 15.80	2.2412	18 25 40.3	0.526					
23	18 20 30.20	2.2388	18 25 5.8	0.624					
24	18 22 44.46	2.2364	S. 18 24 25.4	0.722					

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
1	Regulus W.	92 14 49	2479	93 56 32	2494	95 37 54	2509	97 18 55	2524
	Spica W.	38 49 42	2503	40 30 51	2516	42 11 42	2530	43 52 14	2543
	α Aquilæ E.	61 23 3	3055	59 53 58	3090	58 25 36	3127	56 57 59	3167
	SATURN E.	79 34 33	2500	77 53 19	2515	76 12 27	2530	74 31 55	2545
	Fomalhaut E.	93 16 0	2839	91 42 23	2853	90 9 4	2868	88 36 4	2884
	α Pegasi E.	108 23 28	2741	106 47 42	2750	105 12 9	2761	103 36 50	2773
2	Spica W.	52 10 7	2614	53 48 43	2629	55 26 58	2645	57 4 52	2659
	α Aquilæ E.	49 52 45	3406	48 30 35	3465	47 9 32	3527	45 49 38	3595
	SATURN E.	66 14 35	2624	64 36 12	2640	62 58 11	2655	61 20 31	2672
	Fomalhaut E.	80 56 20	2972	79 25 32	2991	77 55 8	3012	76 25 10	3032
	α Pegasi E.	95 44 18	2839	94 10 41	2854	92 37 23	2869	91 4 24	2884
3	Spica W.	65 9 23	2734	66 45 18	2749	68 20 53	2764	69 56 8	2778
	Antares W.	21 13 54	3185	22 40 21	3142	24 7 40	3110	25 35 38	3085
	SATURN E.	53 17 34	2751	51 42 2	2767	50 6 51	2783	48 32 1	2798
	Fomalhaut E.	69 2 1	3148	67 34 49	3178	66 8 6	3198	64 41 55	3225
	α Pegasi E.	83 24 31	2966	81 53 35	2983	80 23 1	3000	78 52 48	3018
	SUN E.	135 2 7	3077	133 33 29	3092	132 5 10	3109	130 37 11	3124
4	Spica W.	77 47 45	2848	79 21 11	2862	80 54 19	2874	82 27 11	2887
	Antares W.	33 0 49	3035	34 30 19	3032	35 59 52	3032	37 29 25	3033
	SATURN E.	40 42 53	2876	39 10 3	2891	37 37 33	2905	36 5 21	2920
	Fomalhaut E.	57 39 12	3373	56 16 25	3407	54 54 16	3442	53 32 47	3479
	α Pegasi E.	71 27 16	3109	69 59 17	3128	68 31 41	3148	67 4 29	3167
	JUPITER E.	95 20 29	2915	93 48 29	2928	92 16 46	2942	90 45 20	2955
	SUN E.	123 21 48	3199	121 55 37	3213	120 29 43	3226	119 4 5	3240
5	Spica W.	90 7 32	2946	91 38 52	2957	93 9 59	2968	94 40 52	2978
	Antares W.	44 56 24	3052	46 25 33	3056	47 54 36	3062	49 23 32	3067
	SATURN E.	28 29 8	2997	26 58 52	3013	25 28 55	3029	23 59 18	3047
	Fomalhaut E.	46 56 11	3694	45 39 17	3745	44 23 17	3800	43 8 15	3859
	α Pegasi E.	59 54 22	3270	58 29 35	3291	57 5 13	3314	55 41 18	3337
	JUPITER E.	83 12 9	3015	81 42 15	3026	80 12 34	3037	78 43 7	3047
	SUN E.	111 59 49	3303	110 35 41	3315	109 11 47	3326	107 48 6	3337
6	Antares W.	56 46 39	3093	58 14 57	3097	59 43 10	3101	61 11 18	3106
	α Pegasi E.	48 48 38	3467	47 27 37	3497	46 7 9	3529	44 47 17	3563
	JUPITER E.	71 18 46	3091	69 50 25	3098	68 22 13	3105	66 54 10	3112
	SUN E.	100 52 35	3384	99 30 0	3392	98 7 34	3400	96 45 17	3406
7	Antares W.	68 30 45	3123	69 58 27	3124	71 26 7	3127	72 53 44	3128
	JUPITER E.	59 35 41	3138	58 8 17	3141	56 40 57	3144	55 13 41	3147
	SUN E.	89 55 38	3433	88 33 59	3438	87 12 26	3441	85 50 56	3444
8	Antares W.	80 11 30	3130	81 39 3	3129	83 6 37	3129	84 34 12	3128
	α Aquilæ W.	37 48 1	4426	38 52 59	4340	39 59 15	4263	41 6 42	4192



## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
1	Regulus W.	98 59 35	2539	100 39 54	2555	102 19 51	2570	103 59 27	2585
	Spica W.	45 32 28	2557	47 12 22	2571	48 51 57	2585	50 31 12	2600
	α Aquilæ E.	55 31 10	2609	54 5 12	2623	52 40 6	2630	51 15 56	2645
	SATURN E.	72 51 44	2561	71 11 55	2576	69 32 27	2591	67 53 20	2607
	Fomalhaut E.	87 3 24	2900	85 31 5	2916	83 59 7	2935	82 27 32	2953
	α Pegasi E.	102 1 47	2785	100 26 59	2798	98 52 28	2811	97 18 14	2825
2	Spica <sup>1</sup> W.	58 42 27	2675	60 19 41	2690	61 56 35	2705	63 33 9	2720
	α Aquilæ E.	44 30 58	2667	43 13 36	2747	41 57 38	2763	40 43 10	2778
	SATURN E.	59 43 13	2687	58 6 16	2704	56 29 41	2720	54 53 27	2735
	Fomalhaut E.	74 55 37	3054	73 26 31	3077	71 57 53	3100	70 29 43	3123
	α Pegasi E.	89 31 44	2900	87 59 25	2916	86 27 26	2932	84 55 48	2949
3	Spica W.	71 31 5	2793	73 5 42	2807	74 40 1	2821	76 14 2	2835
	Antares W.	27 4 6	3066	28 32 57	3053	30 2 4	3043	31 31 23	3038
	SATURN E.	46 57 31	2814	45 23 21	2830	43 49 32	2845	42 16 3	2860
	Fomalhaut E.	63 16 15	3253	61 51 8	3282	60 26 35	3311	59 2 36	3341
	α Pegasi E.	77 22 57	3035	75 53 28	3053	74 24 21	3072	72 55 37	3091
	SUN E.	129 9 30	3138	127 42 7	3154	126 15 3	3169	124 48 17	3183
4	Spica W.	83 59 46	2900	85 32 5	2912	87 4 9	2924	88 35 58	2935
	Antares W.	38 58 57	3036	40 28 25	3039	41 57 50	3043	43 27 10	3048
	SATURN E.	34 33 28	2936	33 1 55	2950	31 30 40	2966	29 59 44	2981
	Fomalhaut E.	52 11 59	3516	50 51 53	3557	49 32 32	3599	48 13 57	3645
	α Pegasi E.	65 37 40	3186	64 11 14	3206	62 45 12	3227	61 19 35	3248
	JUPITER E.	89 14 11	2968	87 43 18	2980	86 12 40	2992	84 42 17	3004
	SUN E.	117 38 43	3253	116 13 37	3266	114 48 46	3279	113 24 10	3292
5	Spica W.	96 11 33	2987	97 42 2	2997	99 12 19	3006	100 42 25	3014
	Antares W.	50 52 22	3072	52 21 6	3078	53 49 43	3083	55 18 14	3087
	SATURN E.	22 30 3	3065	21 1 11	3085	19 32 43	3108	18 4 43	3134
	Fomalhaut E.	41 54 14	3924	40 41 18	3993	39 29 31	4070	38 19 0	4152
	α Pegasi E.	54 17 49	3360	52 54 47	3386	51 32 14	3412	50 10 11	3439
	JUPITER E.	77 13 52	3056	75 44 49	3065	74 15 57	3074	72 47 16	3083
	SUN E.	106 24 37	3347	105 1 20	3357	103 38 14	3366	102 15 19	3376
6	Antares W.	62 39 20	3110	64 7 18	3114	65 35 11	3117	67 3 0	3120
	α Pegasi E.	43 28 2	3599	42 9 26	3638	40 51 33	3680	39 34 25	3726
	JUPITER E.	65 26 15	3118	63 58 27	3124	62 30 46	3129	61 3 11	3133
	SUN E.	95 23 7	3413	94 1 5	3419	92 39 10	3424	91 17 21	3430
7	Antares W.	74 21 19	3129	75 48 53	3130	77 16 26	3131	78 43 58	3131
	JUPITER E.	53 46 28	3148	52 19 17	3151	50 52 9	3152	49 25 2	3152
	SUN E.	84 29 29	3447	83 8 5	3449	81 46 44	3450	80 25 24	3451
8	Antares W.	86 1 48	3125	87 29 27	3123	88 57 9	3120	90 24 54	3118
	α Aquilæ W.	42 15 16	4127	43 24 52	4069	44 35 24	4014	45 46 50	3963

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.			P. L. of Diff.	IIIh			P. L. of Diff.	VIh			P. L. of Diff.	IXh			P. L. of Diff.
			°	'	"		°	'	"		°	'	"		°	'	"	
8	JUPITER	E.	47	57	55	3153	46	30	49	3153	45	3	43	3152	43	36	36	3150
	SUN	E.	79	4	5	3451	77	42	46	3451	76	21	27	3451	75	0	8	3449
9	Antares	W.	91	52	42	3114	93	20	35	3110	94	48	33	3106	96	16	35	3102
	α Aquilæ	W.	46	59	6	3917	48	12	9	3874	49	25	55	3833	50	40	23	3796
	SATURN	W.	19	44	46	3153	21	11	52	3138	22	39	16	3125	24	6	55	3113
	JUPITER	E.	36	20	26	3137	34	53	1	3134	33	25	32	3129	31	57	57	3124
	SUN	E.	68	13	1	3437	66	51	26	3432	65	29	46	3429	64	8	2	3423
10	α Aquilæ	W.	57	1	46	3637	58	19	40	3611	59	38	3	3585	60	56	54	3559
	SATURN	W.	31	28	38	3061	32	57	36	3050	34	26	47	3040	35	56	10	3031
	JUPITER	E.	24	38	28	3094	23	10	11	3087	21	41	46	3079	20	13	11	3073
	SUN	E.	57	17	48	3394	55	55	24	3386	54	32	52	3379	53	10	12	3372
11	α Aquilæ	W.	67	37	37	3450	68	58	57	3431	70	20	39	3411	71	42	43	3393
	SATURN	W.	43	26	14	2978	44	56	54	2968	46	27	47	2957	47	58	54	2946
	Fomalhaut	W.	36	58	30	4109	38	8	23	4022	39	19	41	3943	40	32	17	3871
	SUN	E.	46	14	30	3329	44	50	52	3319	43	27	3	3311	42	3	4	3301
12	α Aquilæ	W.	78	38	6	3308	80	2	8	3294	81	26	27	3278	82	51	4	3264
	SATURN	W.	55	38	2	2889	57	10	35	2877	58	43	24	2865	60	16	28	2853
	Fomalhaut	W.	46	52	3	3586	48	10	53	3540	49	30	33	3497	50	51	1	3457
	SUN	E.	35	0	21	3254	33	35	16	3245	32	10	0	3236	30	44	33	3228
17	SUN	W.	26	4	36	2814	27	38	46	2801	29	13	13	2787	30	47	58	2775
	Regulus	E.	66	53	41	2441	65	11	5	2434	63	28	18	2427	61	45	21	2420
18	SUN	W.	38	45	20	2726	40	21	25	2718	41	57	41	2710	43	34	8	2703
	Regulus	E.	53	8	18	2389	51	24	28	2384	49	40	30	2379	47	56	25	2374
	Spica	E.	106	40	15	2394	104	56	32	2389	103	12	42	2383	101	28	43	2378
19	SUN	W.	51	38	36	2672	53	15	53	2666	54	53	18	2662	56	30	49	2658
	Regulus	E.	39	14	24	2354	37	29	43	2351	35	44	58	2348	34	0	9	2346
	Spica	E.	92	46	57	2354	91	2	16	2350	89	17	29	2346	87	32	36	2342
20	SUN	W.	64	39	52	2638	66	17	56	2634	67	56	5	2631	69	34	18	2628
	Spica	E.	78	46	57	2326	77	1	36	2324	75	16	12	2322	73	30	44	2320
21	SUN	W.	77	46	16	2616	79	24	49	2615	81	3	24	2613	82	42	1	2611
	Pollux	W.	27	35	13	2693	29	12	3	2650	30	49	50	2614	32	28	26	2583
	Spica	E.	64	42	42	2311	62	56	59	2310	61	11	14	2309	59	25	28	2309
	Antares	E.	110	20	10	2362	108	35	41	2359	106	51	7	2357	105	6	30	2354
22	SUN	W.	90	55	35	2607	92	34	21	2606	94	13	8	2605	95	51	56	2606
	Pollux	W.	40	50	23	2480	42	32	4	2467	44	14	3	2455	45	56	19	2446
	Spica	E.	50	36	29	2309	48	50	42	2309	47	4	55	2310	45	19	10	2311
	Antares	E.	96	22	39	2346	94	37	46	2345	92	52	52	2345	91	7	58	2344
23	SUN	W.	104	5	52	2607	105	44	37	2608	107	23	21	2610	109	2	3	2610
	Pollux	W.	54	30	41	2411	56	14	0	2406	57	57	26	2403	59	40	57	2399
	Regulus	W.	17	32	56	2336	19	18	3	2329	21	3	20	2324	22	48	45	2320

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
8	JUPITER	E.	42 9 27	3148	40 42 16	3147	39 15 3	3143	37 47 46	3141
	SUN	E.	73 38 47	3447	72 17 24	3446	70 56 0	3443	69 34 32	3440
9	Antares	W.	97 44 42	3096	99 12 56	3092	100 41 16	3087	102 9 42	3081
	α Aquilæ	W.	51 55 29	3760	53 11 13	3727	54 27 31	3695	55 44 23	3666
	SATURN	W.	25 34 49	3101	27 2 57	3091	28 31 18	3080	29 59 52	3070
	JUPITER	E.	30 30 17	3119	29 2 30	3114	27 34 37	3107	26 6 36	3101
	SUN	E.	62 46 12	3418	61 24 16	3413	60 2 14	3407	58 40 5	3400
10	α Aquilæ	W.	62 16 13	3536	63 35 57	3514	64 56 6	3491	66 16 40	3471
	SATURN	W.	37 25 45	3020	38 55 33	3010	40 25 34	3000	41 55 47	2989
	JUPITER	E.	18 44 28	3065	17 15 35	3057	15 46 33	3048	14 17 20	3040
	SUN	E.	51 47 23	3363	50 24 24	3355	49 1 16	3346	47 37 58	3338
11	α Aquilæ	W.	73 5 8	3375	74 27 53	3358	75 50 58	3340	77 14 23	3325
	SATURN	W.	49 30 15	2935	51 1 50	2924	52 33 39	2912	54 5 43	2900
	Fomalhaut	W.	41 46 6	3804	43 1 4	3744	44 17 5	3687	45 34 6	3635
	SUN	E.	40 38 53	3292	39 14 32	3282	37 50 0	3272	36 25 16	3263
12	α Aquilæ	W.	84 15 58	3250	85 41 8	3237	87 6 34	3224	88 32 15	3212
	SATURN	W.	61 49 47	2841	63 23 22	2829	64 57 12	2817	66 31 18	2805
	Fomalhaut	W.	52 12 13	3419	53 34 8	3384	54 56 43	3350	56 19 57	3318
	SUN	E.	29 18 57	3220	27 53 12	3213	26 27 18	3206	25 1 16	3202
17	SUN	W.	32 22 59	2764	33 58 14	2753	35 33 44	2744	37 9 26	2735
	Regulus	E.	60 2 15	2413	58 18 59	2407	56 35 34	2401	54 52 0	2395
18	SUN	W.	45 10 44	2696	46 47 29	2690	48 24 23	2683	50 1 26	2678
	Regulus	E.	46 12 13	2370	44 27 55	2365	42 43 30	2362	40 59 0	2357
	Spica	E.	99 44 36	2373	98 0 22	2367	96 16 0	2363	94 31 32	2358
19	SUN	W.	58 8 26	2653	59 46 9	2649	61 23 58	2644	63 1 53	2641
	Regulus	E.	32 15 17	2344	30 30 22	2343	28 45 25	2342	27 0 27	2342
	Spica	E.	85 47 38	2339	84 2 35	2335	82 17 27	2332	80 32 14	2329
20	SUN	W.	71 12 35	2626	72 50 55	2623	74 29 19	2621	76 7 46	2618
	Spica	E.	71 45 13	2318	69 59 39	2316	68 14 3	2314	66 28 24	2312
21	SUN	W.	84 20 41	2610	85 59 22	2609	87 38 5	2608	89 16 49	2607
	Pollux	W.	34 7 45	2556	35 47 41	2533	37 28 9	2513	39 9 4	2496
	Spica	E.	57 39 41	2309	55 53 54	2308	54 8 6	2307	52 22 17	2308
	Antares	E.	103 21 49	2352	101 37 5	2351	99 52 19	2348	98 7 30	2347
22	SUN	W.	97 30 43	2605	99 9 31	2605	100 48 19	2606	102 27 6	2607
	Pollux	W.	47 38 49	2437	49 21 31	2429	51 4 25	2422	52 47 29	2416
	Spica	E.	43 33 27	2313	41 47 46	2315	40 2 8	2317	38 16 33	2320
	Antares	E.	89 23 3	2344	87 38 7	2344	85 53 12	2345	84 8 18	2345
23	SUN	W.	110 40 44	2613	112 19 22	2614	113 57 58	2615	115 36 32	2618
	Pollux	W.	61 24 33	2396	63 8 13	2395	64 51 55	2393	66 35 40	2392
	Regulus	W.	24 34 16	2316	26 19 52	2314	28 5 31	2313	29 51 11	2313

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
23	Spica E.	36 31 3	2324	34 45 38	2327	33 0 18	2333	31 15 6	2338
	Antares E.	82 23 24	2346	80 38 32	2348	78 53 42	2349	77 8 54	2351
24	SUN W.	117 15 2	2621	118 53 29	2624	120 31 51	2627	122 10 10	2630
	Pollux W.	68 19 26	2391	70 3 13	2391	71 47 0	2391	73 30 47	2392
	Regulus W.	31 36 52	2313	33 22 33	2313	35 8 13	2314	36 53 52	2315
	Antares E.	68 25 41	2364	66 41 15	2368	64 56 55	2373	63 12 41	2378
25	Pollux W.	82 9 15	2402	83 52 47	2405	85 36 14	2409	87 19 36	2412
	Regulus W.	45 41 30	2326	47 26 51	2330	49 12 7	2333	50 57 18	2337
	Antares E.	54 33 26	2408	52 50 3	2417	51 6 52	2426	49 23 54	2435
	α Aquilæ E.	103 16 48	2773	101 41 45	2770	100 6 38	2770	98 31 31	2770
26	Pollux W.	95 54 52	2438	97 37 32	2445	99 20 3	2451	101 2 25	2459
	Regulus W.	59 41 41	2360	61 26 13	2366	63 10 37	2372	64 54 52	2378
	Antares E.	40 52 52	2499	39 11 37	2516	37 30 46	2535	35 50 21	2556
	α Aquilæ E.	90 36 24	2786	89 1 38	2792	87 27 0	2800	85 52 32	2808
27	Regulus W.	73 33 49	2412	75 17 6	2421	77 0 11	2429	78 43 5	2436
	Spica W.	20 21 51	2506	22 2 56	2501	23 44 8	2497	25 25 25	2497
	Antares E.	27 36 51	2712	26 0 27	2760	24 25 7	2818	22 51 2	2886
	α Aquilæ E.	78 3 18	2865	76 30 14	2880	74 57 29	2895	73 25 4	2913
	SATURN E.	98 58 32	2419	97 15 25	2427	95 32 29	2436	93 49 45	2443
28	Regulus W.	87 14 31	2483	88 56 8	2492	90 37 32	2502	92 18 42	2513
	Spica W.	33 51 11	2518	35 31 59	2524	37 12 39	2531	38 53 9	2540
	α Aquilæ E.	65 48 55	3017	64 19 3	3043	62 49 44	3070	61 20 58	3100
	SATURN E.	85 19 7	2489	83 37 38	2500	81 56 24	2510	80 15 24	2520
	Fomalhaut E.	97 52 11	2842	96 18 38	2850	94 45 15	2858	93 12 2	2867
29	Spica W.	47 12 36	2585	48 51 51	2596	50 30 51	2607	52 9 36	2618
	α Aquilæ E.	54 6 51	3279	52 42 15	3323	51 18 30	3371	49 55 40	3422
	SATURN E.	71 54 5	2575	70 14 35	2587	68 35 22	2599	66 56 25	2610
	Fomalhaut E.	85 29 14	2924	83 57 26	2938	82 25 55	2953	80 54 43	2967
	α Pegasi E.	100 27 49	2818	98 53 44	2827	97 19 51	2836	95 46 10	2846
30	Spica W.	60 19 35	2675	61 56 48	2687	63 33 45	2699	65 10 26	2711
	Antares W.	16 59 34	3400	18 21 51	3295	19 46 8	3217	21 11 57	3157
	SATURN E.	58 45 47	2672	57 8 30	2685	55 31 30	2699	53 54 48	2711
	Fomalhaut E.	73 23 42	3054	71 54 36	3074	70 25 55	3094	68 57 38	3116
	α Pegasi E.	88 1 17	2906	86 29 6	2920	84 57 12	2933	83 25 35	2947
31	Spica W.	73 9 49	2772	74 44 53	2785	76 19 41	2797	77 54 13	2808
	Antares W.	28 34 22	3014	30 4 17	3003	31 34 26	2996	33 4 44	2991
	SATURN E.	45 55 37	2777	44 20 39	2791	42 45 59	2805	41 11 37	2818
	Fomalhaut E.	61 43 8	3237	60 17 43	3265	58 52 51	3294	57 28 33	3325
	α Pegasi E.	75 52 7	3024	74 22 24	3040	72 53 1	3058	71 24 0	3075
	JUPITER E.	105 43 37	2827	104 9 44	2840	102 36 8	2852	101 2 47	2865

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV <sup>h</sup>	P. L. of Diff.	XVIII <sup>h</sup>	P. L. of Diff.	XXI <sup>h</sup>	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
23	Spica	E.	29 30 2	2345	27 45 8	2353	26 0 26	2363	24 15 58	2375
	Antares	E.	75 24 8	2353	73 39 25	2355	71 54 46	2358	70 10 11	2362
24	SUN	W.	123 48 24	2634	125 26 33	2638	127 4 37	2642	128 42 35	2646
	Pollux	W.	75 14 33	2393	76 58 18	2395	78 42 0	2397	80 25 39	2399
	Regulus	W.	38 39 29	2317	40 25 4	2319	42 10 36	2321	43 56 5	2324
	Antares	E.	61 28 34	2382	59 44 34	2388	58 0 42	2394	56 16 59	2401
25	Pollux	W.	89 2 53	2417	90 46 4	2422	92 29 8	2427	94 12 4	2433
	Regulus	W.	52 42 23	2341	54 27 23	2346	56 12 16	2349	57 57 2	2355
	Antares	E.	47 41 9	2446	45 58 39	2457	44 16 25	2470	42 34 29	2483
	α Aquilæ	E.	96 56 24	2771	95 21 18	2773	93 46 15	2777	92 11 17	2781
26	Pollux	W.	102 44 36	2467	104 26 36	2475	106 8 24	2484	107 50 0	2492
	Regulus	W.	66 38 59	2385	68 22 56	2391	70 6 44	2398	71 50 22	2405
	Antares	E.	34 10 25	2579	32 31 1	2606	30 52 14	2637	29 14 9	2672
	α Aquilæ	E.	84 18 15	2817	82 44 9	2828	81 10 17	2839	79 36 40	2851
27	Regulus	W.	80 25 48	2445	82 8 18	2455	83 50 35	2463	85 32 40	2473
	Spica	W.	27 6 42	2499	28 47 57	2502	30 29 8	2506	32 10 13	2511
	Antares	E.	21 18 25	2970	19 47 35	3074	18 18 54	3208	16 52 54	3320
	α Aquilæ	E.	71 53 1	2931	70 21 21	2950	68 50 5	2971	67 19 16	2993
	SATURN	E.	92 7 12	2453	90 24 52	2461	88 42 44	2470	87 0 49	2480
28	Regulus	W.	93 59 37	2524	95 40 17	2535	97 20 42	2545	99 0 53	2556
	Spica	W.	40 33 27	2548	42 13 33	2557	43 53 27	2567	45 33 8	2576
	α Aquilæ	E.	59 52 48	3131	58 25 16	3164	56 58 24	3200	55 32 15	3238
	SATURN	E.	78 34 38	2530	76 54 7	2541	75 13 51	2552	73 33 50	2564
	Fomalhaut	E.	91 39 1	2877	90 6 13	2888	88 33 39	2899	87 1 19	2911
29	Spica	W.	53 48 6	2629	55 26 22	2641	57 4 22	2652	58 42 6	2663
	α Aquilæ	E.	48 33 48	3477	47 12 58	3537	45 53 15	3602	44 34 43	3672
	SATURN	E.	65 17 44	2622	63 39 19	2635	62 1 12	2647	60 23 21	2660
	Fomalhaut	E.	79 23 49	2983	77 53 15	3000	76 23 2	3018	74 53 11	3035
	α Pegasi	E.	94 12 42	2857	92 39 28	2869	91 6 29	2880	89 33 45	2893
30	Spica	W.	66 46 51	2724	68 22 59	2735	69 58 52	2748	71 34 28	2760
	Antares	W.	22 38 58	3111	24 6 54	3076	25 35 33	3049	27 4 45	3029
	SATURN	E.	52 18 23	2724	50 42 15	2738	49 6 25	2750	47 30 52	2764
	Fomalhaut	E.	67 29 48	3138	66 2 25	3164	64 35 30	3186	63 9 4	3211
	α Pegasi	E.	81 54 16	2962	80 23 15	2977	78 52 33	2992	77 22 10	3008
31	Spica	W.	79 28 30	2821	81 2 31	2833	82 36 16	2845	84 9 45	2856
	Antares	W.	34 35 8	2988	36 5 36	2987	37 36 5	2987	39 6 34	2989
	SATURN	E.	39 37 32	2831	38 3 44	2845	36 30 15	2859	34 57 3	2873
	Fomalhaut	E.	56 4 51	3357	54 41 45	3391	53 19 18	3427	51 57 32	3464
	α Pegasi	E.	69 55 20	3092	68 27 1	3111	66 59 5	3130	65 31 32	3150
	JUPITER	E.	99 29 43	2877	97 56 54	2889	96 24 21	2901	94 52 3	2913

## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S						Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from		Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.	Added to Apparent Time.				
		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>'</sup> <sup>"</sup>	<sup>s</sup>	<sup>m</sup> <sup>s</sup>	<sup>s</sup>		
Wed.	1	4 35 42.52	10.225	N.22 2 8.1	+20.55	15 47.94	68.37	2 26.55	0.367		
Thur.	2	4 39 48.12	10.242	22 10 9.8	19.59	15 47.80	68.43	2 17.52	0.384		
Frid.	3	4 43 54.13	10.259	22 17 48.3	18.62	15 47.66	68.48	2 8.09	0.401		
Sat.	4	4 48 0.53	10.274	22 25 3.5	+17.65	15 47.52	68.53	1 58.28	0.417		
SUN.	5	4 52 7.30	10.289	22 31 55.3	16.67	15 47.39	68.58	1 48.09	0.432		
Mon.	6	4 56 14.42	10.304	22 38 23.4	15.68	15 47.27	68.63	1 37.56	0.446		
Tues.	7	5 0 21.87	10.317	22 44 27.8	+14.68	15 47.15	68.67	1 26.69	0.459		
Wed.	8	5 4 29.64	10.330	22 50 8.2	13.68	15 47.03	68.71	1 15.51	0.472		
Thur.	9	5 8 37.70	10.342	22 55 24.6	12.68	15 46.92	68.74	1 4.04	0.484		
Frid.	10	5 12 46.04	10.352	23 0 17.0	+11.68	15 46.81	68.78	0 52.29	0.495		
Sat.	11	5 16 54.61	10.362	23 4 45.0	10.67	15 46.71	68.81	0 40.31	0.504		
SUN.	12	5 21 3.42	10.371	23 8 48.7	9.65	15 46.61	68.84	0 28.09	0.513		
Mon.	13	5 25 12.42	10.379	23 12 28.0	+8.63	15 46.52	68.86	0 15.69	0.520		
Tues.	14	5 29 21.59	10.385	23 15 42.7	7.61	15 46.43	68.88	0 3.11	0.526		
Wed.	15	5 33 30.90	10.390	23 18 32.9	6.58	15 46.35	68.90	0 9.61	0.532		
Thur.	16	5 37 40.32	10.394	23 20 58.4	+5.55	15 46.27	68.91	0 22.44	0.537		
Frid.	17	5 41 49.83	10.397	23 22 59.2	4.52	15 46.20	68.92	0 35.37	0.540		
Sat.	18	5 45 59.40	10.399	23 24 35.2	3.48	15 46.14	68.93	0 48.34	0.541		
SUN.	19	5 50 9.00	10.400	23 25 46.5	+2.45	15 46.08	68.94	1 1.35	0.542		
Mon.	20	5 54 18.61	10.400	23 26 33.0	1.42	15 46.03	68.94	1 14.36	0.542		
Tues.	21	5 58 28.20	10.399	23 26 54.7	+0.38	15 45.98	68.94	1 27.36	0.541		
Wed.	22	6 2 37.75	10.396	23 26 51.5	-0.65	15 45.93	68.94	1 40.31	0.539		
Thur.	23	6 6 47.23	10.393	23 26 23.6	1.68	15 45.89	68.93	1 53.21	0.536		
Frid.	24	6 10 56.63	10.390	23 25 30.8	2.71	15 45.85	68.92	2 6.02	0.531		
Sat.	25	6 15 5.93	10.385	23 24 13.4	-3.74	15 45.81	68.90	2 18.72	0.526		
SUN.	26	6 19 15.10	10.379	23 22 31.1	4.77	15 45.78	68.89	2 31.30	0.521		
Mon.	27	6 23 24.13	10.373	23 20 24.2	5.80	15 45.75	68.87	2 43.74	0.515		
Tues.	28	6 27 33.00	10.366	23 17 52.7	-6.82	15 45.73	68.85	2 56.01	0.508		
Wed.	29	6 31 41.69	10.358	23 14 56.6	7.84	15 45.71	68.82	3 8.12	0.500		
Thur.	30	6 35 50.18	10.349	23 11 36.2	8.86	15 45.69	68.79	3 20.02	0.491		
Frid.	31	6 39 58.45	10.339	N.23 7 51.3	-9.88	15 45.67	68.76	3 31.70	0.482		

NOTE.—The mean time of semidiameter passing the meridian may be found by subtracting 0.19 from the sidereal time. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the sign — indicates that north declinations are decreasing.

## AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to		Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Subtracted from Mean Time.			
Wed.	1	h m s 4 35 42.93	s 10.224	° ' " N.22 2 8.9	" + 20.55	m s 2 26.54	s 0.367	h m s 4 38 9.47	
Thur.	2	4 39 48.51	10.241	22 10 10.5	19.59	2 17.51	0.384	4 42 6.03	
Frid.	3	4 43 54.50	10.257	22 17 49.0	18.62	2 8.08	0.401	4 46 2.58	
Sat.	4	4 48 0.87	10.273	22 25 4.1	+ 17.65	1 58.27	0.417	4 49 59.14	
SUN.	5	4 52 7.60	10.288	22 31 55.8	16.67	1 48.09	0.432	4 53 55.70	
Mon.	6	4 56 14.70	10.303	22 38 23.8	15.68	1 37.56	0.446	4 57 52.25	
Tues.	7	5 0 22.12	10.316	22 44 28.1	+ 14.68	1 26.69	0.460	5 1 48.81	
Wed.	8	5 4 29.86	10.329	22 50 8.5	13.68	1 15.51	0.472	5 5 45.37	
Thur.	9	5 8 37.89	10.340	22 55 24.9	12.68	1 4.04	0.484	5 9 41.92	
Frid.	10	5 12 46.18	10.351	23 0 17.1	+ 11.67	0 52.29	0.495	5 13 38.48	
Sat.	11	5 16 54.73	10.360	23 4 45.1	10.66	0 40.30	0.504	5 17 35.03	
SUN.	12	5 21 3.50	10.369	23 8 48.8	9.65	0 28.09	0.513	5 21 31.59	
Mon.	13	5 25 12.46	10.377	23 12 28.0	+ 8.63	0 15.69	0.520	5 25 28.15	
Tues.	14	5 29 21.59	10.384	23 15 42.8	7.60	0 3.11	0.527	5 29 24.71	
Wed.	15	5 33 30.87	10.389	23 18 32.9	6.58	0 9.61	0.532	5 33 21.26	
Thur.	16	5 37 40.26	10.393	23 20 58.4	+ 5.55	0 22.44	0.537	5 37 17.82	
Frid.	17	5 41 49.73	10.396	23 22 59.2	4.52	0 35.36	0.540	5 41 14.37	
Sat.	18	5 45 59.26	10.398	23 24 35.2	3.49	0 48.33	0.541	5 45 10.93	
SUN.	19	5 50 8.82	10.399	23 25 46.5	+ 2.45	1 1.34	0.542	5 49 7.49	
Mon.	20	5 54 18.39	10.399	23 26 33.0	1.42	1 14.35	0.542	5 53 4.05	
Tues.	21	5 58 27.94	10.397	23 26 54.7	+ 0.39	1 27.35	0.541	5 57 0.60	
Wed.	22	6 2 37.46	10.395	23 26 51.6	- 0.65	1 40.30	0.538	6 0 57.16	
Thur.	23	6 6 46.90	10.392	23 26 23.6	1.68	1 53.19	0.535	6 4 53.72	
Frid.	24	6 10 56.27	10.388	23 25 30.9	2.71	2 6.00	0.532	6 8 50.27	
Sat.	25	6 15 5.53	10.384	23 24 13.5	- 3.74	2 18.70	0.527	6 12 46.83	
SUN.	26	6 19 14.66	10.378	23 22 31.3	4.77	2 31.28	0.521	6 16 43.39	
Mon.	27	6 23 23.66	10.372	23 20 24.5	5.80	2 43.72	0.515	6 20 39.94	
Tues.	28	6 27 32.49	10.364	23 17 53.0	- 6.82	2 55.99	0.508	6 24 36.50	
Wed.	29	6 31 41.15	10.356	23 14 57.1	7.84	3 8.09	0.500	6 28 33.06	
Thur.	30	6 35 49.60	10.348	23 11 36.7	8.86	3 19.99	0.491	6 32 29.61	
Frid.	31	6 39 57.84	10.338	N.23 7 51.9	- 9.87	3 31.67	0.482	6 36 26.17	

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the sign — indicates that north declinations are decreasing.

Diff. for 1 Hour,  
+9°.8565.  
(Table III.)

AT GREENWICH MEAN NOON.								
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		$\lambda$	$\lambda'$					
1	153	70 32 19.2	32 1.0	143.63	+ 0.23	0.006 1683	+ 27.1	h m s 19 18 40.19
2	154	71 29 46.0	29 27.6	143.60	0.17	0.006 2326	26.5	19 14 44.28
3	155	72 27 12.1	26 53.5	143.57	0.10	0.006 2954	25.8	19 10 48.37
4	156	73 24 37.4	24 18.7	143.54	+ 0.01	0.006 3566	+ 25.2	19 6 52.46
5	157	74 22 2.0	21 43.2	143.51	— 0.09	0.006 4162	24.5	19 2 56.55
6	158	75 19 26.0	19 7.0	143.49	0.21	0.006 4740	23.7	18 59 0.64
7	159	76 16 49.4	16 30.3	143.46	— 0.33	0.006 5299	+ 22.9	18 55 4.73
8	160	77 14 12.3	13 53.0	143.44	0.45	0.006 5839	22.0	18 51 8.82
9	161	78 11 34.6	11 15.1	143.42	0.55	0.006 6357	21.1	18 47 12.91
10	162	79 8 56.3	8 36.7	143.39	— 0.64	0.006 6853	+ 20.2	18 43 16.99
11	163	80 6 17.5	5 57.7	143.37	0.71	0.006 7326	19.2	18 39 21.08
12	164	81 3 38.1	3 18.2	143.35	0.76	0.006 7774	18.2	18 35 25.17
13	165	82 0 58.2	0 38.1	143.32	— 0.78	0.006 8197	+ 17.1	18 31 29.26
14	166	82 58 17.6	57 57.3	143.30	0.77	0.006 8595	16.0	18 27 33.35
15	167	83 55 36.3	55 15.9	143.27	0.73	0.006 8966	14.9	18 23 37.44
16	168	84 52 54.4	52 33.8	143.24	— 0.67	0.006 9311	+ 13.9	18 19 41.53
17	169	85 50 11.7	49 51.0	143.21	0.57	0.006 9632	12.9	18 15 45.62
18	170	86 47 28.2	47 7.3	143.17	0.45	0.006 9928	11.9	18 11 49.71
19	171	87 44 44.0	44 23.0	143.14	— 0.31	0.007 0202	+ 10.9	18 7 53.80
20	172	88 41 59.0	41 37.8	143.11	0.18	0.007 0453	10.0	18 3 57.89
21	173	89 39 13.3	38 51.9	143.08	— 0.04	0.007 0685	9.2	18 0 1.97
22	174	90 36 26.9	36 5.4	143.05	+ 0.09	0.007 0897	+ 8.5	17 56 6.06
23	175	91 33 39.9	33 18.2	143.03	0.19	0.007 1092	7.8	17 52 10.15
24	176	92 30 52.3	30 30.4	143.01	0.28	0.007 1270	7.1	17 48 14.24
25	177	93 28 4.2	27 42.1	142.99	+ 0.34	0.007 1433	+ 6.5	17 44 18.33
26	178	94 25 15.6	24 53.4	142.97	0.36	0.007 1580	5.8	17 40 22.42
27	179	95 22 26.8	22 4.4	142.96	0.37	0.007 1713	5.2	17 36 26.51
28	180	96 19 37.7	19 15.2	142.95	+ 0.34	0.007 1831	+ 4.6	17 32 30.60
29	181	97 16 48.5	16 25.9	142.95	0.29	0.007 1934	4.0	17 28 34.69
30	182	98 13 59.3	13 36.5	142.95	0.22	0.007 2022	3.3	17 24 38.78
31	183	99 11 10.1	10 47.1	142.95	+ 0.14	0.007 2095	+ 2.7	17 20 42.87
NOTE.—The longitudes in the column $\lambda$ are referred to the true equinox of their own date, while those in the column $\lambda'$ are referred to the mean equinox of the beginning of the Besselian fictitious year.								
								Diff. for 1 Hour, — 9'.8296. (Table II.)



## GREENWICH MEAN TIME.

## THE MOON'S

Day of the Month.	SEMI- DIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	
	' "	' "	' "	"	' "	"	h m	m	d
1	15 8.2	15 3.9	55 27.1	- 1.35	55 11.6	- 1.24	15 7.4	2.02	17.0
2	15 0.1	14 56.7	54 57.4	1.10	54 45.0	0.95	15 54.9	1.94	18.0
3	14 53.9	14 51.6	54 34.5	0.78	54 26.2	0.60	16 40.5	1.86	19.0
4	14 49.9	14 49.0	54 20.1	- 0.40	54 16.5	- 0.20	17 24.4	1.81	20.0
5	14 48.6	14 49.0	54 15.3	+ 0.01	54 16.7	+ 0.23	18 7.4	1.78	21.0
6	14 50.1	14 51.9	54 20.7	0.44	54 27.3	0.65	18 50.0	1.78	22.0
7	14 54.4	14 57.5	54 36.4	+ 0.85	54 47.9	+ 1.05	19 33.1	1.82	23.0
8	15 1.2	15 5.5	55 1.6	1.23	55 17.4	1.39	20 17.5	1.89	24.0
9	15 10.4	15 15.6	55 35.1	1.54	55 54.4	1.66	21 3.8	1.98	25.0
10	15 21.2	15 27.1	56 14.9	+ 1.75	56 36.4	+ 1.81	21 52.8	2.10	26.0
11	15 33.0	15 39.0	56 58.3	1.83	57 20.4	1.83	22 44.7	2.23	27.0
12	15 44.9	15 50.7	57 42.1	1.78	58 3.1	1.70	23 39.5	2.33	28.0
13	15 56.0	16 1.0	58 22.8	+ 1.58	58 41.0	+ 1.43	0 36.6	2.40	29.0
14	16 5.4	16 9.3	58 57.3	1.26	59 11.4	1.07	0 36.6	2.40	0.6
15	16 12.4	16 14.9	59 23.0	0.86	59 32.0	0.64	1 34.7	2.42	1.6
16	16 16.6	16 17.7	59 38.5	+ 0.43	59 42.3	+ 0.21	2 32.7	2.39	2.6
17	16 18.0	16 17.8	59 43.6	+ 0.01	59 42.6	- 0.17	3 29.4	2.32	3.6
18	16 16.9	16 15.5	59 39.4	- 0.34	59 34.4	0.49	4 24.3	2.25	4.6
19	16 13.7	16 11.4	59 27.6	- 0.63	59 19.4	- 0.74	5 17.4	2.18	5.6
20	16 8.8	16 6.0	59 9.9	0.83	58 59.4	0.90	6 9.1	2.14	6.6
21	16 2.9	15 59.6	58 48.1	0.97	58 36.0	1.03	7 0.1	2.12	7.6
22	15 56.2	15 52.6	58 23.4	- 1.07	58 10.3	- 1.11	7 50.9	2.12	8.6
23	15 48.9	15 45.1	57 56.7	1.15	57 42.7	1.17	8 42.0	2.14	9.6
24	15 41.2	15 37.2	57 28.4	1.20	57 13.8	1.23	9 33.8	2.17	10.6
25	15 33.2	15 29.1	56 59.0	- 1.24	56 44.0	- 1.25	10 25.9	2.18	11.6
26	15 25.0	15 20.9	56 28.8	1.26	56 13.7	1.25	11 18.1	2.16	12.6
27	15 16.8	15 12.8	55 58.7	1.24	55 43.9	1.21	12 9.7	2.12	13.6
28	15 8.9	15 5.1	55 29.6	- 1.17	55 15.9	- 1.11	12 59.9	2.06	14.6
29	15 1.6	14 58.3	55 2.9	1.04	54 50.9	0.95	13 48.4	1.98	15.6
30	14 55.4	14 52.8	54 40.1	0.84	54 30.7	0.72	14 35.0	1.90	16.6
31	14 50.7	14 49.0	54 22.9	0.58	54 16.8	0.43	15 19.8	1.84	17.6
32	14 47.9	14 47.3	54 12.6	- 0.26	54 10.5	- 0.08	16 3.1	1.79	18.6

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 1.					FRIDAY 3.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	19 15 38.10	2.1688	S. 17 40 8.0	2.926	0	20 56 1.78	2.0156	S. 13 51 0.0	6.395
1	19 17 48.14	2.1657	17 37 9.9	3.012	1	20 58 2.63	2.0127	13 44 34.6	6.453
2	19 19 57.98	2.1625	17 34 6.6	3.098	2	21 0 3.30	2.0097	13 38 5.7	6.510
3	19 22 7.64	2.1594	17 30 58.2	3.183	3	21 2 3.79	2.0068	13 31 33.4	6.567
4	19 24 17.11	2.1563	17 27 44.7	3.267	4	21 4 4.11	2.0039	13 24 57.7	6.623
5	19 26 26.39	2.1531	17 24 26.2	3.350	5	21 6 4.26	2.0010	13 18 18.7	6.678
6	19 28 35.48	2.1498	17 21 2.7	3.433	6	21 8 4.23	1.9982	13 11 36.4	6.733
7	19 30 44.37	2.1467	17 17 34.3	3.515	7	21 10 4.04	1.9954	13 4 50.8	6.787
8	19 32 53.08	2.1435	17 14 0.9	3.597	8	21 12 3.68	1.9926	12 58 2.0	6.840
9	19 35 1.59	2.1403	17 10 22.6	3.678	9	21 14 3.15	1.9898	12 51 10.0	6.893
10	19 37 9.91	2.1370	17 6 39.5	3.759	10	21 16 2.46	1.9872	12 44 14.8	6.947
11	19 39 18.03	2.1338	17 2 51.5	3.840	11	21 18 1.61	1.9844	12 37 16.4	6.998
12	19 41 25.96	2.1305	16 58 58.7	3.920	12	21 20 0.59	1.9818	12 30 15.0	7.049
13	19 43 33.69	2.1273	16 55 1.1	3.999	13	21 21 59.42	1.9792	12 23 10.5	7.100
14	19 45 41.23	2.1240	16 50 58.8	4.077	14	21 23 58.09	1.9765	12 16 3.0	7.151
15	19 47 48.57	2.1208	16 46 51.8	4.155	15	21 25 56.60	1.9739	12 8 52.4	7.201
16	19 49 55.72	2.1175	16 42 40.2	4.233	16	21 27 54.96	1.9713	12 1 38.9	7.249
17	19 52 2.67	2.1142	16 38 23.9	4.309	17	21 29 53.16	1.9688	11 54 22.5	7.298
18	19 54 9.42	2.1108	16 34 3.1	4.385	18	21 31 51.22	1.9664	11 47 3.2	7.346
19	19 56 15.97	2.1076	16 29 37.7	4.461	19	21 33 49.13	1.9639	11 39 41.0	7.393
20	19 58 22.33	2.1043	16 25 7.8	4.536	20	21 35 46.89	1.9614	11 32 16.0	7.440
21	20 0 28.49	2.1010	16 20 33.4	4.611	21	21 37 44.50	1.9590	11 24 48.2	7.487
22	20 2 34.45	2.0978	16 15 54.5	4.685	22	21 39 41.97	1.9567	11 17 17.6	7.533
23	20 4 40.22	2.0945	S. 16 11 11.2	4.758	23	21 41 39.31	1.9544	S. 11 9 44.3	7.578
THURSDAY 2.					SATURDAY 4.				
0	20 6 45.79	2.0912	S. 16 6 23.6	4.830	0	21 43 36.50	1.9521	S. 11 2 8.3	7.623
1	20 8 51.16	2.0879	16 1 31.6	4.902	1	21 45 33.56	1.9498	10 54 29.6	7.667
2	20 10 56.34	2.0848	15 56 35.3	4.973	2	21 47 30.48	1.9477	10 46 48.3	7.709
3	20 13 1.33	2.0815	15 51 34.8	5.044	3	21 49 27.28	1.9455	10 39 4.5	7.753
4	20 15 6.12	2.0782	15 46 30.0	5.115	4	21 51 23.94	1.9433	10 31 18.0	7.796
5	20 17 10.71	2.0749	15 41 21.0	5.185	5	21 53 20.47	1.9412	10 23 29.0	7.838
6	20 19 15.11	2.0717	15 36 7.8	5.254	6	21 55 16.88	1.9392	10 15 37.5	7.879
7	20 21 19.31	2.0684	15 30 50.5	5.322	7	21 57 13.17	1.9371	10 7 43.5	7.920
8	20 23 23.32	2.0652	15 25 29.2	5.389	8	21 59 9.33	1.9351	9 59 47.1	7.960
9	20 25 27.14	2.0620	15 20 3.8	5.457	9	22 1 5.38	1.9332	9 51 48.3	8.000
10	20 27 30.76	2.0588	15 14 34.3	5.524	10	22 3 1.31	1.9312	9 43 47.1	8.039
11	20 29 34.20	2.0557	15 9 0.9	5.590	11	22 4 57.12	1.9293	9 35 43.6	8.078
12	20 31 37.44	2.0524	15 3 23.5	5.656	12	22 6 52.82	1.9274	9 27 37.7	8.117
13	20 33 40.49	2.0493	14 57 42.2	5.721	13	22 8 48.41	1.9257	9 19 29.6	8.154
14	20 35 43.36	2.0462	14 51 57.0	5.785	14	22 10 43.90	1.9239	9 11 19.2	8.192
15	20 37 46.03	2.0430	14 46 8.0	5.848	15	22 12 39.28	1.9221	9 3 6.6	8.228
16	20 39 48.52	2.0399	14 40 15.2	5.912	16	22 14 34.55	1.9204	8 54 51.8	8.265
17	20 41 50.82	2.0368	14 34 18.6	5.974	17	22 16 29.73	1.9188	8 46 34.8	8.300
18	20 43 52.93	2.0337	14 28 18.3	6.036	18	22 18 24.81	1.9172	8 38 15.8	8.335
19	20 45 54.86	2.0307	14 22 14.3	6.098	19	22 20 19.79	1.9157	8 29 54.6	8.370
20	20 47 56.61	2.0276	14 16 6.6	6.158	20	22 22 14.69	1.9142	8 21 31.4	8.404
21	20 49 58.17	2.0246	14 9 55.3	6.218	21	22 24 9.49	1.9126	8 13 6.1	8.438
22	20 51 59.56	2.0216	14 3 40.4	6.278	22	22 26 4.20	1.9112	8 4 38.9	8.470
23	20 54 0.76	2.0185	13 57 22.0	6.337	23	22 27 58.83	1.9098	7 56 9.7	8.503
24	20 56 1.78	2.0156	S. 13 51 0.0	6.395	24	22 29 53.38	1.9085	S. 7 47 38.5	8.536

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 5.					TUESDAY 7.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	22 29 53.38	1.9085	S. 7 47 38.5	8.536	0	0 0 48.80	1.8985	S. 0 30 31.4	9.484
1	22 31 47.85	1.9072	7 39 5.4	8.567	1	0 2 42.74	1.8995	0 21 2.1	9.492
2	22 33 42.24	1.9059	7 30 30.5	8.598	2	0 4 36.74	1.9006	0 11 32.4	9.498
3	22 35 36.56	1.9047	7 21 53.7	8.629	3	0 6 30.81	1.9017	S. 0 2 2.3	9.504
4	22 37 30.80	1.9035	7 13 15.0	8.659	4	0 8 24.95	1.9028	N. 0 7 28.1	9.510
5	22 39 24.98	1.9024	7 4 34.6	8.688	5	0 10 19.15	1.9040	0 16 58.9	9.516
6	22 41 19.09	1.9013	6 55 52.5	8.717	6	0 12 13.43	1.9053	0 26 30.0	9.520
7	22 43 13.13	1.9002	6 47 8.6	8.746	7	0 14 7.78	1.9066	0 36 1.3	9.523
8	22 45 7.11	1.8992	6 38 23.0	8.774	8	0 16 2.22	1.9080	0 45 32.8	9.527
9	22 47 1.04	1.8983	6 29 35.7	8.802	9	0 17 56.74	1.9093	0 55 4.5	9.530
10	22 48 54.91	1.8974	6 20 46.8	8.828	10	0 19 51.34	1.9108	1 4 36.4	9.532
11	22 50 48.73	1.8965	6 11 56.3	8.855	11	0 21 46.03	1.9123	1 14 8.4	9.534
12	22 52 42.49	1.8957	6 3 4.2	8.881	12	0 23 40.81	1.9138	1 23 40.5	9.536
13	22 54 36.21	1.8949	5 54 10.6	8.907	13	0 25 35.69	1.9154	1 33 12.7	9.537
14	22 56 29.88	1.8941	5 45 15.4	8.932	14	0 27 30.66	1.9171	1 42 44.9	9.536
15	22 58 23.51	1.8936	5 36 18.8	8.956	15	0 29 25.74	1.9188	1 52 17.0	9.535
16	23 0 17.11	1.8930	5 27 20.7	8.980	16	0 31 20.92	1.9206	2 1 49.1	9.535
17	23 2 10.67	1.8923	5 18 21.2	9.003	17	0 33 16.21	1.9223	2 11 21.2	9.533
18	23 4 4.19	1.8918	5 9 20.3	9.027	18	0 35 11.60	1.9242	2 20 53.1	9.531
19	23 5 57.68	1.8913	5 0 18.0	9.049	19	0 37 7.11	1.9262	2 30 24.9	9.528
20	23 7 51.15	1.8909	4 51 14.4	9.072	20	0 39 2.74	1.9281	2 39 56.5	9.525
21	23 9 44.59	1.8905	4 42 9.4	9.093	21	0 40 58.48	1.9301	2 49 27.9	9.521
22	23 11 38.01	1.8902	4 33 3.2	9.113	22	0 42 54.35	1.9323	2 58 59.0	9.515
23	23 13 31.41	1.8898	S. 4 23 55.8	9.134	23	0 44 50.34	1.9343	N. 3 8 29.7	9.510
MONDAY 6.					WEDNESDAY 8.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	23 15 24.79	1.8896	S. 4 14 47.1	9.155	0	0 46 46.46	1.9364	N. 3 18 0.2	9.505
1	23 17 18.16	1.8894	4 5 37.2	9.174	1	0 48 42.71	1.9387	3 27 30.3	9.498
2	23 19 11.52	1.8893	3 56 26.2	9.193	2	0 50 39.10	1.9409	3 36 59.9	9.490
3	23 21 4.87	1.8892	3 47 14.0	9.212	3	0 52 35.62	1.9432	3 46 29.1	9.483
4	23 22 58.22	1.8892	3 38 0.8	9.229	4	0 54 32.28	1.9455	3 55 57.8	9.474
5	23 24 51.57	1.8892	3 28 46.5	9.247	5	0 56 29.08	1.9479	4 5 26.0	9.466
6	23 26 44.92	1.8892	3 19 31.1	9.265	6	0 58 26.03	1.9504	4 14 53.7	9.456
7	23 28 38.27	1.8893	3 10 14.7	9.281	7	1 0 23.13	1.9529	4 24 20.7	9.445
8	23 30 31.63	1.8894	3 0 57.4	9.297	8	1 2 20.38	1.9555	4 33 47.1	9.434
9	23 32 25.00	1.8896	2 51 39.1	9.313	9	1 4 17.79	1.9581	4 43 12.8	9.423
10	23 34 18.38	1.8898	2 42 19.8	9.328	10	1 6 15.35	1.9607	4 52 37.8	9.411
11	23 36 11.78	1.8902	2 32 59.7	9.343	11	1 8 13.07	1.9634	5 2 2.1	9.398
12	23 38 5.20	1.8905	2 23 38.7	9.357	12	1 10 10.96	1.9662	5 11 25.5	9.383
13	23 39 58.64	1.8909	2 14 16.9	9.370	13	1 12 9.02	1.9690	5 20 48.1	9.369
14	23 41 52.11	1.8913	2 4 54.3	9.383	14	1 14 7.24	1.9718	5 30 9.8	9.354
15	23 43 45.60	1.8918	1 55 31.0	9.395	15	1 16 5.63	1.9747	5 39 30.6	9.339
16	23 45 39.12	1.8923	1 46 6.9	9.407	16	1 18 4.20	1.9777	5 48 50.5	9.323
17	23 47 32.68	1.8930	1 36 42.1	9.419	17	1 20 2.95	1.9807	5 58 9.3	9.305
18	23 49 26.28	1.8936	1 27 16.6	9.430	18	1 22 1.88	1.9837	6 7 27.1	9.287
19	23 51 19.91	1.8943	1 17 50.5	9.440	19	1 24 0.99	1.9868	6 16 43.8	9.269
20	23 53 13.59	1.8951	1 8 23.8	9.450	20	1 26 0.29	1.9898	6 25 59.4	9.250
21	23 55 7.32	1.8958	0 58 56.5	9.460	21	1 27 59.77	1.9930	6 35 13.8	9.230
22	23 57 1.09	1.8967	0 49 28.6	9.469	22	1 29 59.45	1.9962	6 44 27.0	9.209
23	23 58 54.92	1.8976	0 40 0.2	9.477	23	1 31 59.32	1.9995	6 53 38.9	9.187
24	0 0 48.80	1.8985	S. 0 30 31.4	9.484	24	1 33 59.39	2.0028	N. 7 2 49.5	9.165

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 9.					SATURDAY 11.				
0	h m s	a	° ' "	"	0	h m s	a	° ' "	"
1	1 33 59.39	2.0028	N. 7 2 49.5	9.165	1	3 14 39.17	2.2031	N. 13 41 48.5	7.122
2	1 35 59.66	2.0061	7 11 58.7	9.143	2	3 16 51.50	2.2078	13 48 53.9	7.057
3	1 38 0.12	2.0095	7 21 6.6	9.119	3	3 19 4.11	2.2125	13 55 55.3	6.990
4	1 40 0.80	2.0130	7 30 13.0	9.094	4	3 21 17.00	2.2173	14 2 52.7	6.923
5	1 42 1.68	2.0164	7 39 17.9	9.069	5	3 23 30.18	2.2221	14 9 46.1	6.856
6	1 44 2.77	2.0199	7 48 21.3	9.043	6	3 25 43.65	2.2268	14 16 35.4	6.787
7	1 46 4.07	2.0235	7 57 23.1	9.016	7	3 27 57.40	2.2316	14 23 20.5	6.716
8	1 48 5.59	2.0271	8 6 23.2	8.988	8	3 30 11.44	2.2363	14 30 1.3	6.645
9	1 50 7.32	2.0307	8 15 21.7	8.961	9	3 32 25.76	2.2411	14 36 37.9	6.574
10	1 52 9.28	2.0344	8 24 18.5	8.932	10	3 34 40.37	2.2459	14 43 10.2	6.502
11	1 54 11.45	2.0381	8 33 13.5	8.902	11	3 36 55.27	2.2507	14 49 38.1	6.427
12	1 56 13.85	2.0419	8 42 6.7	8.871	12	3 39 10.45	2.2554	14 56 1.4	6.351
13	1 58 16.48	2.0458	8 50 58.0	8.839	13	3 41 25.92	2.2602	15 2 20.2	6.276
14	2 0 19.34	2.0496	8 59 47.4	8.807	14	3 43 41.67	2.2649	15 8 34.5	6.199
15	2 2 22.43	2.0534	9 8 34.9	8.774	15	3 45 57.71	2.2697	15 14 44.1	6.121
16	2 4 25.75	2.0573	9 17 20.3	8.740	16	3 48 14.03	2.2743	15 20 49.0	6.042
17	2 6 29.31	2.0613	9 26 3.7	8.706	17	3 50 30.63	2.2791	15 26 49.1	5.962
18	2 8 33.11	2.0653	9 34 45.0	8.670	18	3 52 47.52	2.2838	15 32 44.4	5.882
19	2 10 37.14	2.0693	9 43 24.1	8.633	19	3 55 4.68	2.2884	15 38 34.9	5.800
20	2 12 41.42	2.0734	9 52 1.0	8.597	20	3 57 22.13	2.2931	15 44 20.4	5.717
21	2 14 45.95	2.0775	10 0 35.7	8.558	21	3 59 39.85	2.2978	15 50 1.0	5.634
22	2 16 50.72	2.0816	10 9 8.0	8.519	22	4 1 57.86	2.3024	15 55 36.5	5.549
23	2 18 55.74	2.0858	10 17 38.0	8.479	23	4 4 16.14	2.3069	16 1 6.9	5.463
24	2 21 1.02	2.0900	N. 10 26 5.5	8.438	24	4 6 34.69	2.3115	N. 16 6 32.1	5.377
FRIDAY 10.					SUNDAY 12.				
0	2 23 6.54	2.0942	N. 10 34 30.6	8.397	0	4 8 53.52	2.3162	N. 16 11 52.1	5.289
1	2 25 12.32	2.0985	10 42 53.1	8.354	1	4 11 12.63	2.3207	16 17 6.8	5.201
2	2 27 18.36	2.1028	10 51 13.1	8.311	2	4 13 32.00	2.3252	16 22 16.2	5.112
3	2 29 24.65	2.1070	10 59 30.4	8.266	3	4 15 51.65	2.3298	16 27 20.3	5.022
4	2 31 31.20	2.1114	11 7 45.0	8.221	4	4 18 11.57	2.3342	16 32 18.9	4.930
5	2 33 38.02	2.1158	11 15 56.9	8.175	5	4 20 31.75	2.3385	16 37 11.9	4.838
6	2 35 45.10	2.1203	11 24 6.0	8.128	6	4 22 52.19	2.3429	16 41 59.4	4.745
7	2 37 52.45	2.1247	11 32 12.3	8.080	7	4 25 12.90	2.3473	16 46 41.3	4.652
8	2 40 0.06	2.1291	11 40 15.6	8.031	8	4 27 33.87	2.3517	16 51 17.6	4.557
9	2 42 7.94	2.1336	11 48 16.0	7.982	9	4 29 55.10	2.3559	16 55 48.1	4.461
10	2 44 16.09	2.1381	11 56 13.4	7.931	10	4 32 16.58	2.3602	17 0 12.9	4.364
11	2 46 24.51	2.1426	12 4 7.7	7.879	11	4 34 38.32	2.3644	17 4 31.8	4.266
12	2 48 33.20	2.1472	12 11 58.9	7.827	12	4 37 0.31	2.3686	17 8 44.8	4.167
13	2 50 42.17	2.1518	12 19 46.9	7.773	13	4 39 22.55	2.3727	17 12 51.9	4.068
14	2 52 51.41	2.1563	12 27 31.7	7.718	14	4 41 45.04	2.3768	17 16 53.0	3.968
15	2 55 0.93	2.1609	12 35 13.1	7.663	15	4 44 7.77	2.3808	17 20 48.1	3.867
16	2 57 10.72	2.1656	12 42 51.2	7.607	16	4 46 30.74	2.3848	17 24 37.1	3.765
17	2 59 20.80	2.1702	12 50 25.9	7.549	17	4 48 53.95	2.3888	17 28 19.9	3.663
18	3 1 31.15	2.1748	12 57 57.1	7.491	18	4 51 17.39	2.3926	17 31 56.6	3.560
19	3 3 41.78	2.1795	13 5 24.8	7.432	19	4 53 41.06	2.3965	17 35 27.1	3.456
20	3 5 52.69	2.1843	13 12 48.9	7.372	20	4 56 4.97	2.4003	17 38 51.3	3.351
21	3 8 3.89	2.1890	13 20 9.4	7.311	21	4 58 29.10	2.4040	17 42 9.2	3.245
22	3 10 15.37	2.1937	13 27 26.2	7.249	22	5 0 53.45	2.4077	17 45 20.7	3.138
23	3 12 27.13	2.1983	13 34 39.3	7.186	23	5 3 18.03	2.4114	17 48 25.8	3.031
24	3 14 39.17	2.2031	N. 13 41 48.5	7.122	24	5 5 42.82	2.4149	N. 17 51 24.4	2.923

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 13.					WEDNESDAY 15.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
1	5 5 42.82	2.4149	N.17 51 24.4	2.923	1	7 4 23.24	2.4992	N.17 57 42.3	2.763
2	5 8 7.82	2.4184	17 54 16.6	2.815	2	7 6 53.19	2.4989	17 54 52.9	2.884
3	5 10 33.03	2.4219	17 57 2.2	2.705	3	7 9 23.11	2.4986	17 51 56.2	3.005
4	5 12 58.45	2.4253	17 59 41.2	2.595	4	7 11 53.02	2.4983	17 48 52.3	3.124
5	5 15 24.07	2.4286	18 2 13.6	2.485	5	7 14 22.90	2.4978	17 45 41.3	3.243
6	5 17 49.88	2.4318	18 4 39.4	2.374	6	7 16 52.75	2.4972	17 42 23.1	3.363
7	5 20 15.88	2.4350	18 6 58.5	2.262	7	7 19 22.56	2.4965	17 38 57.7	3.483
8	5 22 42.08	2.4382	18 9 10.8	2.149	8	7 21 52.33	2.4958	17 35 25.2	3.601
9	5 25 8.46	2.4413	18 11 16.4	2.036	9	7 24 22.05	2.4950	17 31 45.6	3.719
10	5 27 35.03	2.4443	18 13 15.1	1.922	10	7 26 51.73	2.4942	17 27 58.9	3.837
11	5 30 1.77	2.4471	18 15 7.0	1.808	11	7 29 21.35	2.4932	17 24 5.2	3.953
12	5 32 28.68	2.4499	18 16 52.1	1.693	12	7 31 50.91	2.4922	17 20 4.5	4.070
13	5 34 55.76	2.4527	18 18 30.2	1.578	13	7 34 20.41	2.4911	17 15 56.8	4.187
14	5 37 23.01	2.4554	18 20 1.4	1.462	14	7 36 49.84	2.4899	17 11 42.1	4.303
15	5 39 50.41	2.4580	18 21 25.6	1.345	15	7 39 19.20	2.4887	17 7 20.5	4.418
16	5 42 17.97	2.4607	18 22 42.8	1.228	16	7 41 48.48	2.4873	17 2 52.0	4.533
17	5 44 45.69	2.4632	18 23 52.9	1.110	17	7 44 17.68	2.4860	16 58 16.6	4.647
18	5 47 13.55	2.4655	18 24 56.0	0.992	18	7 46 46.80	2.4846	16 53 34.4	4.760
19	5 49 41.55	2.4678	18 25 52.0	0.874	19	7 49 15.83	2.4831	16 48 45.4	4.873
20	5 52 9.69	2.4701	18 26 40.9	0.756	20	7 51 44.77	2.4815	16 43 49.7	4.985
21	5 54 37.96	2.4723	18 27 22.7	0.637	21	7 54 13.61	2.4798	16 38 47.2	5.097
22	5 57 6.36	2.4743	18 27 57.4	0.518	22	7 56 42.35	2.4782	16 33 38.1	5.207
23	5 59 34.88	2.4763	18 28 24.8	0.398	23	7 59 10.99	2.4764	16 28 22.4	5.317
24	6 2 3.52	2.4782	N.18 28 45.1	0.278	24	8 1 39.52	2.4746	N.16 23 0.1	5.427
TUESDAY 14.					THURSDAY 16.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
1	6 4 32.27	2.4801	N.18 28 58.1	0.157	1	8 4 7.94	2.4728	N.16 17 31.2	5.536
2	6 7 1.13	2.4819	18 29 3.9	+0.037	2	8 6 36.25	2.4708	16 11 55.8	5.643
3	6 9 30.10	2.4836	18 29 2.5	-0.084	3	8 9 4.44	2.4688	16 6 14.0	5.750
4	6 11 59.16	2.4852	18 28 53.8	0.206	4	8 11 32.51	2.4668	16 0 25.8	5.857
5	6 14 28.32	2.4868	18 28 37.8	0.327	5	8 14 0.46	2.4648	15 54 31.2	5.963
6	6 16 57.57	2.4882	18 28 14.6	0.448	6	8 16 28.28	2.4626	15 48 30.3	6.068
7	6 19 26.90	2.4894	18 27 44.0	0.570	7	8 18 55.97	2.4604	15 42 23.1	6.172
8	6 21 56.30	2.4907	18 27 6.2	0.692	8	8 21 23.53	2.4582	15 36 9.7	6.275
9	6 24 25.78	2.4919	18 26 21.0	0.814	9	8 23 50.95	2.4558	15 29 50.1	6.377
10	6 26 55.33	2.4931	18 25 28.5	0.936	10	8 26 18.23	2.4536	15 23 24.4	6.479
11	6 29 24.95	2.4941	18 24 28.7	1.058	11	8 28 45.38	2.4513	15 16 52.6	6.580
12	6 31 54.62	2.4949	18 23 21.6	1.180	12	8 31 12.38	2.4488	15 10 14.8	6.679
13	6 34 24.34	2.4957	18 22 7.1	1.302	13	8 33 39.24	2.4464	15 3 31.1	6.778
14	6 36 54.11	2.4965	18 20 45.3	1.425	14	8 36 5.95	2.4439	14 56 41.5	6.876
15	6 39 23.92	2.4972	18 19 16.1	1.547	15	8 38 32.51	2.4413	14 49 46.0	6.973
16	6 41 53.77	2.4977	18 17 39.7	1.668	16	8 40 58.91	2.4388	14 42 44.8	7.068
17	6 44 23.65	2.4982	18 15 55.9	1.792	17	8 43 25.16	2.4362	14 35 37.8	7.163
18	6 46 53.55	2.4986	18 14 4.7	1.913	18	8 45 51.25	2.4336	14 28 25.2	7.257
19	6 49 23.48	2.4990	18 12 6.3	2.035	19	8 48 17.19	2.4309	14 21 6.9	7.351
20	6 51 53.43	2.4992	18 10 0.5	2.157	20	8 50 42.96	2.4282	14 13 43.1	7.443
21	6 54 23.38	2.4993	18 7 47.4	2.278	21	8 53 8.57	2.4255	14 6 13.8	7.533
22	6 56 53.35	2.4995	18 5 27.1	2.400	22	8 55 34.02	2.4228	13 58 39.1	7.623
23	6 59 23.32	2.4994	18 2 59.4	2.522	23	8 57 59.31	2.4200	13 50 59.0	7.713
24	7 1 53.28	2.4993	18 0 24.5	2.643	24	9 0 24.42	2.4172	13 43 13.6	7.801
	7 4 23.24	2.4992	N.17 57 42.3	2.763		9 2 49.37	2.4144	N.13 35 22.9	7.888

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 17.					SUNDAY 19.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	9 2 49.37	2.4144	N. 13 35 22.9	7.888	0	10 55 22.74	2.2793	N. 5 58 3.3	10.722
1	9 5 14.15	2.4116	13 27 27.1	7.973	1	10 57 39.43	2.2771	5 47 19.1	10.751
2	9 7 38.76	2.4087	13 19 26.2	8.058	2	10 59 55.99	2.2747	5 36 33.2	10.780
3	9 10 3.19	2.4058	13 11 20.2	8.141	3	11 2 12.40	2.2724	5 25 45.5	10.808
4	9 12 27.45	2.4029	13 3 9.3	8.223	4	11 4 28.68	2.2702	5 14 56.2	10.835
5	9 14 51.54	2.4001	12 54 53.4	8.305	5	11 6 44.83	2.2680	5 4 5.3	10.861
6	9 17 15.46	2.3972	12 46 32.7	8.385	6	11 9 0.84	2.2658	4 53 12.9	10.885
7	9 19 39.20	2.3942	12 38 7.2	8.465	7	11 11 16.73	2.2637	4 42 19.1	10.908
8	9 22 2.76	2.3912	12 29 36.9	8.543	8	11 13 32.48	2.2615	4 31 23.9	10.931
9	9 24 26.14	2.3883	12 21 2.0	8.620	9	11 15 48.11	2.2595	4 20 27.4	10.953
10	9 26 49.35	2.3853	12 12 22.5	8.697	10	11 18 3.62	2.2575	4 9 29.6	10.973
11	9 29 12.38	2.3824	12 3 38.4	8.772	11	11 20 19.01	2.2555	3 58 30.7	10.991
12	9 31 35.24	2.3795	11 54 49.9	8.845	12	11 22 34.28	2.2536	3 47 30.7	11.008
13	9 33 57.92	2.3764	11 45 57.0	8.917	13	11 24 49.44	2.2517	3 36 29.7	11.025
14	9 36 20.41	2.3734	11 36 59.8	8.989	14	11 27 4.48	2.2498	3 25 27.7	11.040
15	9 38 42.73	2.3705	11 27 58.3	9.059	15	11 29 19.41	2.2479	3 14 24.9	11.054
16	9 41 4.87	2.3675	11 18 52.7	9.128	16	11 31 34.23	2.2461	3 3 21.2	11.067
17	9 43 26.83	2.3645	11 9 42.9	9.197	17	11 33 48.94	2.2443	2 52 16.8	11.079
18	9 45 48.61	2.3616	11 0 29.1	9.263	18	11 36 3.55	2.2427	2 41 11.7	11.090
19	9 48 10.22	2.3587	10 51 11.3	9.329	19	11 38 18.06	2.2410	2 30 6.0	11.100
20	9 50 31.65	2.3557	10 41 49.6	9.393	20	11 40 32.47	2.2393	2 18 59.7	11.109
21	9 52 52.90	2.3527	10 32 24.1	9.457	21	11 42 46.78	2.2377	2 7 52.9	11.117
22	9 55 13.97	2.3497	10 22 54.8	9.519	22	11 45 0.99	2.2362	1 56 45.7	11.123
23	9 57 34.86	2.3468	N. 10 13 21.8	9.581	23	11 47 15.12	2.2347	N. 1 45 38.2	11.128
SATURDAY 18.					MONDAY 20.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	9 59 55.58	2.3439	N. 10 3 45.1	9.641	0	11 49 29.15	2.2332	N. 1 34 30.3	11.133
1	10 2 16.13	2.3410	9 54 4.9	9.698	1	11 51 43.10	2.2317	1 23 22.2	11.136
2	10 4 36.50	2.3380	9 44 21.3	9.756	2	11 53 56.96	2.2303	1 12 14.0	11.137
3	10 6 56.69	2.3352	9 34 34.2	9.813	3	11 56 10.74	2.2290	1 1 5.7	11.138
4	10 9 16.72	2.3323	9 24 43.8	9.867	4	11 58 24.44	2.2277	0 49 57.4	11.138
5	10 11 36.57	2.3294	9 14 50.2	9.921	5	12 0 38.06	2.2264	0 38 49.1	11.137
6	10 13 56.25	2.3266	9 4 53.3	9.974	6	12 2 51.61	2.2252	0 27 40.9	11.135
7	10 16 15.76	2.3238	8 54 53.3	10.025	7	12 5 5.08	2.2239	0 16 32.9	11.132
8	10 18 35.10	2.3210	8 44 50.3	10.076	8	12 7 18.48	2.2228	N. 0 5 25.1	11.128
9	10 20 54.28	2.3183	8 34 44.2	10.126	9	12 9 31.82	2.2218	S. 0 5 42.4	11.123
10	10 23 13.29	2.3154	8 24 35.2	10.173	10	12 11 45.10	2.2208	0 16 49.6	11.116
11	10 25 32.13	2.3127	8 14 23.4	10.220	11	12 13 58.31	2.2197	0 27 56.3	11.108
12	10 27 50.81	2.3100	8 4 8.8	10.266	12	12 16 11.46	2.2187	0 39 2.5	11.099
13	10 30 9.33	2.3073	7 53 51.5	10.310	13	12 18 24.55	2.2178	0 50 8.2	11.089
14	10 32 27.68	2.3046	7 43 31.6	10.353	14	12 20 37.59	2.2169	1 1 13.2	11.078
15	10 34 45.88	2.3020	7 33 9.1	10.395	15	12 22 50.58	2.2161	1 12 17.6	11.067
16	10 37 3.92	2.2993	7 22 44.2	10.436	16	12 25 3.52	2.2153	1 23 21.2	11.053
17	10 39 21.80	2.2967	7 12 16.8	10.477	17	12 27 16.41	2.2145	1 34 24.0	11.040
18	10 41 39.53	2.2942	7 1 47.0	10.515	18	12 29 29.26	2.2137	1 45 26.0	11.025
19	10 43 57.10	2.2917	6 51 15.0	10.552	19	12 31 42.06	2.2130	1 56 27.0	11.009
20	10 46 14.53	2.2892	6 40 40.8	10.588	20	12 33 54.82	2.2124	2 7 27.1	10.992
21	10 48 31.80	2.2867	6 30 4.5	10.623	21	12 36 7.55	2.2118	2 18 26.1	10.974
22	10 50 48.93	2.2842	6 19 26.1	10.657	22	12 38 20.24	2.2112	2 29 24.0	10.955
23	10 53 5.91	2.2817	6 8 45.7	10.690	23	12 40 32.89	2.2107	2 40 20.7	10.935
24	10 55 22.74	2.2793	N. 5 58 3.3	10.722	24	12 42 45.52	2.2102	S. 2 51 16.2	10.914

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 21.					THURSDAY 23.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	12 42 45.52	2.2102	S. 2 51 16.2	10.914	0	14 28 57.34	2.2256	S. 10 52 39.2	8.795
1	12 44 58.12	2.2098	3 2 10.4	10.892	1	14 31 10.90	2.2264	11 1 25.0	8.730
2	12 47 10.70	2.2094	3 13 3.2	10.869	2	14 33 24.51	2.2273	11 10 6.8	8.663
3	12 49 23.25	2.2090	3 23 54.7	10.845	3	14 35 38.17	2.2282	11 18 44.6	8.597
4	12 51 35.78	2.2088	3 34 44.6	10.819	4	14 37 51.89	2.2291	11 27 18.4	8.529
5	12 53 48.30	2.2085	3 45 33.0	10.793	5	14 40 5.66	2.2300	11 35 48.1	8.461
6	12 56 0.80	2.2082	3 56 19.8	10.767	6	14 42 19.49	2.2309	11 44 13.7	8.391
7	12 58 13.28	2.2080	4 7 5.0	10.739	7	14 44 33.37	2.2318	11 52 35.0	8.321
8	13 0 25.76	2.2078	4 17 48.5	10.710	8	14 46 47.31	2.2328	12 0 52.2	8.251
9	13 2 38.22	2.2076	4 28 30.2	10.680	9	14 49 1.30	2.2337	12 9 5.1	8.179
10	13 4 50.67	2.2075	4 39 10.1	10.649	10	14 51 15.35	2.2347	12 17 13.7	8.107
11	13 7 3.12	2.2075	4 49 48.1	10.617	11	14 53 29.46	2.2356	12 25 17.9	8.033
12	13 9 15.57	2.2075	5 0 24.1	10.583	12	14 55 43.62	2.2365	12 33 17.7	7.960
13	13 11 28.02	2.2074	5 10 58.1	10.550	13	14 57 57.84	2.2375	12 41 13.1	7.886
14	13 13 40.46	2.2074	5 21 30.1	10.515	14	15 0 12.12	2.2384	12 49 4.0	7.810
15	13 15 52.91	2.2076	5 31 59.9	10.479	15	15 2 26.45	2.2393	12 56 50.3	7.734
16	13 18 5.37	2.2077	5 42 27.6	10.443	16	15 4 40.84	2.2403	13 4 32.1	7.658
17	13 20 17.83	2.2078	5 52 53.0	10.405	17	15 6 55.28	2.2412	13 12 9.3	7.582
18	13 22 30.31	2.2080	6 3 16.2	10.367	18	15 9 9.78	2.2422	13 19 41.9	7.503
19	13 24 42.79	2.2082	6 13 37.0	10.327	19	15 11 24.34	2.2431	13 27 9.7	7.425
20	13 26 55.29	2.2084	6 23 55.4	10.287	20	15 13 38.95	2.2440	13 34 32.9	7.347
21	13 29 7.80	2.2087	6 34 11.4	10.246	21	15 15 53.62	2.2449	13 41 13.1	7.266
22	13 31 20.33	2.2090	6 44 24.9	10.203	22	15 18 8.34	2.2458	13 49 4.8	7.185
23	13 33 32.88	2.2093	S. 6 54 35.8	10.160	23	15 20 23.12	2.2468	S. 13 56 13.5	7.105
WEDNESDAY 22.					FRIDAY 24.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	13 35 45.45	2.2097	S. 7 4 44.1	10.116	0	15 22 37.95	2.2477	S. 14 3 17.4	7.023
1	13 37 58.04	2.2101	7 14 49.7	10.071	1	15 24 52.84	2.2485	14 10 16.3	6.941
2	13 40 10.66	2.2105	7 24 52.6	10.025	2	15 27 7.77	2.2493	14 17 10.3	6.858
3	13 42 23.30	2.2109	7 34 52.7	9.978	3	15 29 22.76	2.2503	14 23 59.3	6.775
4	13 44 35.97	2.2114	7 44 50.0	9.931	4	15 31 37.80	2.2512	14 30 43.3	6.691
5	13 46 48.67	2.2119	7 54 44.4	9.882	5	15 33 52.90	2.2520	14 37 22.2	6.606
6	13 49 1.40	2.2125	8 4 35.8	9.833	6	15 36 8.04	2.2528	14 43 56.0	6.521
7	13 51 14.17	2.2130	8 14 24.3	9.783	7	15 38 23.23	2.2535	14 50 24.7	6.435
8	13 53 26.96	2.2135	8 24 9.7	9.731	8	15 40 38.46	2.2543	14 56 48.2	6.348
9	13 55 39.79	2.2142	8 33 52.0	9.679	9	15 42 53.75	2.2552	15 3 6.5	6.262
10	13 57 52.66	2.2148	8 43 31.2	9.625	10	15 45 9.08	2.2558	15 9 19.6	6.175
11	14 0 5.57	2.2154	8 53 7.1	9.572	11	15 47 24.45	2.2566	15 15 27.5	6.087
12	14 2 18.51	2.2160	9 2 39.8	9.518	12	15 49 39.87	2.2573	15 21 30.0	5.998
13	14 4 31.49	2.2167	9 12 9.2	9.462	13	15 51 55.33	2.2580	15 27 27.2	5.909
14	14 6 44.52	2.2175	9 21 35.2	9.404	14	15 54 10.83	2.2588	15 33 19.1	5.819
15	14 8 57.59	2.2183	9 30 57.7	9.347	15	15 56 26.38	2.2594	15 39 5.5	5.729
16	14 11 10.71	2.2190	9 40 16.8	9.289	16	15 58 41.96	2.2599	15 44 46.6	5.639
17	14 13 23.87	2.2197	9 49 32.4	9.231	17	16 0 57.57	2.2605	15 50 22.2	5.548
18	14 15 37.07	2.2205	9 58 44.5	9.171	18	16 3 13.22	2.2612	15 55 52.4	5.457
19	14 17 50.33	2.2213	10 7 52.9	9.110	19	16 5 28.91	2.2618	16 1 17.0	5.365
20	14 20 3.63	2.2221	10 16 57.7	9.049	20	16 7 44.63	2.2622	16 6 36.2	5.273
21	14 22 16.98	2.2229	10 25 58.8	8.987	21	16 10 0.37	2.2627	16 11 49.8	5.180
22	14 24 30.38	2.2238	10 34 56.1	8.923	22	16 12 16.15	2.2632	16 16 57.8	5.087
23	14 26 43.83	2.2247	10 43 49.6	8.859	23	16 14 31.95	2.2636	16 22 0.3	4.994
24	14 28 57.34	2.2256	S. 10 52 39.2	8.795	24	16 16 47.78	2.2640	S. 16 26 57.1	4.900

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 25.					MONDAY 27.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	16 16 47.78	2.2640	S. 16 26 57.1	4.900	0	18 5 14.60	2.2387	S. 18 29 32.1	0.173
1	16 19 3.63	2.2644	16 31 48.3	4.806	1	18 7 28.87	2.2371	18 29 39.5	- 0.074
2	16 21 19.51	2.2647	16 36 33.8	4.712	2	18 9 43.05	2.2355	18 29 41.0	+ 0.024
3	16 23 35.40	2.2650	16 41 13.7	4.617	3	18 11 57.13	2.2338	18 29 36.6	0.123
4	16 25 51.31	2.2653	16 45 47.8	4.522	4	18 14 11.11	2.2321	18 29 26.3	0.220
5	16 28 7.24	2.2656	16 50 16.3	4.427	5	18 16 24.98	2.2303	18 29 10.2	0.317
6	16 30 23.18	2.2658	16 54 39.0	4.330	6	18 18 38.75	2.2286	18 28 48.3	0.414
7	16 32 39.14	2.2660	16 58 55.9	4.233	7	18 20 52.41	2.2268	18 28 20.5	0.511
8	16 34 55.10	2.2661	17 3 7.0	4.137	8	18 23 5.96	2.2249	18 27 47.0	0.607
9	16 37 11.07	2.2663	17 7 12.4	4.041	9	18 25 19.40	2.2230	18 27 7.7	0.703
10	16 39 27.05	2.2664	17 11 11.9	3.943	10	18 27 32.72	2.2210	18 26 22.6	0.800
11	16 41 43.04	2.2664	17 15 5.6	3.847	11	18 29 45.92	2.2190	18 25 31.7	0.896
12	16 43 59.02	2.2663	17 18 53.5	3.749	12	18 31 59.00	2.2170	18 24 35.1	0.991
13	16 46 15.00	2.2663	17 22 35.5	3.651	13	18 34 11.96	2.2150	18 23 32.8	1.086
14	16 48 30.98	2.2663	17 26 11.6	3.553	14	18 36 24.80	2.2128	18 22 24.8	1.181
15	16 50 46.96	2.2662	17 29 41.9	3.455	15	18 38 37.50	2.2107	18 21 11.1	1.276
16	16 53 2.93	2.2660	17 33 6.2	3.356	16	18 40 50.08	2.2086	18 19 51.7	1.370
17	16 55 18.88	2.2658	17 36 24.6	3.258	17	18 43 2.53	2.2063	18 18 26.7	1.463
18	16 57 34.83	2.2657	17 39 37.1	3.159	18	18 45 14.84	2.2041	18 16 56.2	1.556
19	16 59 50.76	2.2653	17 42 43.7	3.060	19	18 47 27.02	2.2018	18 15 20.0	1.649
20	17 2 6.67	2.2650	17 45 44.3	2.960	20	18 49 39.06	2.1995	18 13 38.3	1.742
21	17 4 22.56	2.2647	17 48 38.9	2.861	21	18 51 50.96	2.1972	18 11 51.0	1.834
22	17 6 38.43	2.2643	17 51 27.6	2.762	22	18 54 2.72	2.1948	18 9 58.2	1.926
23	17 8 54.27	2.2638	S. 17 54 10.3	2.663	23	18 56 14.33	2.1923	S. 18 7 59.9	2.017
SUNDAY 26.					TUESDAY 28.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	17 11 10.09	2.2634	S. 17 56 47.1	2.563	0	18 58 25.80	2.1899	S. 18 5 56.1	2.108
1	17 13 25.88	2.2628	17 59 17.9	2.463	1	19 0 37.12	2.1874	18 3 46.9	2.198
2	17 15 41.63	2.2623	18 1 42.6	2.363	2	19 2 48.29	2.1849	18 1 32.3	2.288
3	17 17 57.35	2.2617	18 4 1.4	2.263	3	19 4 59.31	2.1823	17 59 12.3	2.378
4	17 20 13.03	2.2610	18 6 14.2	2.163	4	19 7 10.17	2.1798	17 56 46.9	2.468
5	17 22 28.67	2.2603	18 8 21.0	2.063	5	19 9 20.88	2.1773	17 54 16.2	2.556
6	17 24 44.27	2.2596	18 10 21.8	1.963	6	19 11 31.44	2.1746	17 51 40.2	2.644
7	17 26 59.82	2.2588	18 12 16.6	1.863	7	19 13 41.83	2.1719	17 48 58.9	2.732
8	17 29 15.32	2.2579	18 14 5.3	1.763	8	19 15 52.07	2.1692	17 46 12.3	2.820
9	17 31 30.77	2.2571	18 15 48.1	1.663	9	19 18 2.14	2.1666	17 43 20.5	2.907
10	17 33 46.17	2.2562	18 17 24.9	1.563	10	19 20 12.06	2.1639	17 40 23.5	2.993
11	17 36 1.51	2.2552	18 18 55.6	1.463	11	19 22 21.81	2.1611	17 37 21.4	3.078
12	17 38 16.79	2.2542	18 20 20.4	1.363	12	19 24 31.39	2.1583	17 34 14.1	3.164
13	17 40 32.01	2.2531	18 21 39.2	1.263	13	19 26 40.81	2.1556	17 31 1.7	3.249
14	17 42 47.16	2.2520	18 22 52.0	1.163	14	19 28 50.06	2.1528	17 27 44.2	3.333
15	17 45 2.25	2.2509	18 23 58.8	1.063	15	19 30 59.14	2.1498	17 24 21.7	3.417
16	17 47 17.27	2.2497	18 24 59.6	0.964	16	19 33 8.04	2.1470	17 20 54.2	3.500
17	17 49 32.22	2.2485	18 25 54.5	0.865	17	19 35 16.78	2.1442	17 17 21.7	3.583
18	17 51 47.09	2.2473	18 26 43.4	0.766	18	19 37 25.34	2.1413	17 13 44.2	3.666
19	17 54 1.89	2.2459	18 27 26.4	0.667	19	19 39 33.73	2.1383	17 10 1.8	3.747
20	17 56 16.60	2.2445	18 28 3.4	0.568	20	19 41 41.94	2.1354	17 6 14.6	3.828
21	17 58 31.23	2.2431	18 28 34.5	0.468	21	19 43 49.98	2.1325	17 2 22.5	3.908
22	18 0 45.77	2.2417	18 28 59.6	0.369	22	19 45 57.84	2.1296	16 58 25.6	3.988
23	18 3 0.23	2.2403	18 29 18.8	0.271	23	19 48 5.53	2.1266	16 54 23.9	4.068
24	18 5 14.60	2.2387	S. 18 29 32.1	0.173	24	19 50 13.03	2.1235	S. 16 50 17.4	4.148



GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 29.					FRIDAY JULY 1, 1904.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	19 50 13.03	2.1235	S. 16 50 17.4	4.148	0	21 28 39.37	1.9807	S. 12 11 39.6	7.228
1	19 52 20.35	2.1206	16 46 6.2	4.226	PHASES OF THE MOON.				
2	19 54 27.50	2.1176	16 41 50.3	4.303					
3	19 56 34.46	2.1145	16 37 29.8	4.380					
4	19 58 41.24	2.1114	16 33 4.7	4.457					
5	20 0 47.83	2.1084	16 28 35.0	4.533					
6	20 2 54.25	2.1054	16 24 0.8	4.608					
7	20 5 0.48	2.1023	16 19 22.0	4.683					
8	20 7 6.53	2.0993	16 14 38.8	4.758					
9	20 9 12.40	2.0963	16 9 51.1	4.831					
10	20 11 18.08	2.0932	16 4 59.1	4.903					
11	20 13 23.58	2.0901	16 0 2.7	4.977	☾ Last Quarter . . . June 5 17 52.8 ● New Moon . . . . . 13 9 10.5 ☾ First Quarter . . . . . 20 3 10.6 ○ Full Moon . . . . . 27 8 23.4				
12	20 15 28.89	2.0870	15 55 1.9	5.049					
13	20 17 34.02	2.0839	15 49 56.8	5.120					
14	20 19 38.96	2.0808	15 44 47.5	5.190					
15	20 21 43.72	2.0778	15 39 34.0	5.260					
16	20 23 48.30	2.0748	15 34 16.3	5.330					
17	20 25 52.69	2.0716	15 28 54.4	5.399					
18	20 27 56.89	2.0685	15 23 28.4	5.467					
19	20 30 0.91	2.0655	15 17 58.3	5.535					
20	20 32 4.75	2.0624	15 12 24.2	5.602					
21	20 34 8.40	2.0593	15 6 46.1	5.668					
22	20 36 11.87	2.0563	15 1 4.0	5.734					
23	20 38 15.15	2.0532	S. 14 55 18.0	5.799					
THURSDAY 30.									
0	20 40 18.25	2.0502	S. 14 49 28.1	5.863					
1	20 42 21.17	2.0471	14 43 34.4	5.927					
2	20 44 23.90	2.0440	14 37 36.8	5.991					
3	20 46 26.45	2.0410	14 31 35.5	6.053					
4	20 48 28.82	2.0380	14 25 30.4	6.116					
5	20 50 31.01	2.0350	14 19 21.6	6.178					
6	20 52 33.02	2.0320	14 13 9.1	6.238					
7	20 54 34.85	2.0290	14 6 53.0	6.298					
8	20 56 36.50	2.0261	14 0 33.3	6.358					
9	20 58 37.98	2.0231	13 54 10.1	6.417					
10	21 0 39.27	2.0201	13 47 43.3	6.475					
11	21 2 40.39	2.0172	13 41 13.1	6.533					
12	21 4 41.34	2.0143	13 34 39.4	6.590					
13	21 6 42.11	2.0114	13 28 2.3	6.647					
14	21 8 42.71	2.0085	13 21 21.8	6.703					
15	21 10 43.13	2.0056	13 14 38.0	6.758					
16	21 12 43.38	2.0028	13 7 50.9	6.813					
17	21 14 43.47	2.0000	13 1 0.5	6.867					
18	21 16 43.38	1.9971	12 54 6.9	6.920					
19	21 18 43.12	1.9943	12 47 10.1	6.973					
20	21 20 42.70	1.9916	12 40 10.2	7.025					
21	21 22 42.11	1.9888	12 33 7.1	7.077					
22	21 24 41.36	1.9862	12 26 1.0	7.128					
23	21 26 40.45	1.9834	12 18 51.8	7.178					
24	21 28 39.37	1.9807	S. 12 11 39.6	7.228					

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
1	Spica W.	85 43 1	2868	87 16 1	2880	88 48 46	2891	90 21 17	2902
	Antares W.	40 37 0	2992	42 7 23	2995	43 37 42	2999	45 7 56	3005
	SATURN E.	33 24 9	2887	31 51 33	2901	30 19 15	2916	28 47 16	2931
	Fomalhaut E.	50 36 28	3504	49 16 8	3547	47 56 36	3592	46 37 53	3640
	α Pegasi E.	64 4 23	3169	62 37 37	3190	61 11 16	3210	59 45 19	3233
	JUPITER E.	93 20 0	2925	91 48 13	2936	90 16 40	2947	88 45 21	2958
	α Arietis E.	107 5 44	2984	105 35 11	2993	104 4 50	3003	102 34 41	3013
2	Spica W.	98 0 26	2954	99 31 37	2963	101 2 36	2973	102 33 23	2982
	Antares W.	52 37 26	3032	54 6 59	3039	55 36 24	3045	57 5 41	3051
	α Pegasi E.	52 42 21	3354	51 19 12	3382	49 56 35	3411	48 34 31	3442
	JUPITER E.	81 12 12	3011	79 42 13	3021	78 12 26	3030	76 42 50	3039
	α Arietis E.	95 6 53	3060	93 37 54	3069	92 9 6	3078	90 40 30	3087
	SUN E.	130 58 7	3324	129 34 23	3333	128 10 50	3342	126 47 27	3351
3	Antares W.	64 30 19	3079	65 58 54	3085	67 27 22	3090	68 55 44	3094
	α Pegasi E.	41 53 30	3628	40 35 26	3674	39 18 11	3724	38 1 49	3779
	JUPITER E.	69 17 31	3079	67 48 56	3087	66 20 30	3092	64 52 11	3099
	α Arietis E.	83 20 5	3129	81 52 30	3137	80 25 5	3144	78 57 49	3151
	SUN E.	119 52 59	3391	118 30 32	3398	117 8 13	3404	115 46 1	3410
4	Antares W.	76 16 17	3113	77 44 11	3116	79 12 1	3119	80 39 48	3120
	JUPITER E.	57 32 19	3123	56 4 37	3126	54 36 59	3129	53 9 25	3133
	α Arietis E.	71 43 34	3184	70 17 6	3191	68 50 46	3196	67 24 32	3202
	SUN E.	108 56 37	3435	107 35 0	3438	106 13 27	3441	104 51 57	3441
5	Antares W.	87 58 16	3125	89 25 55	3124	90 53 35	3124	92 21 15	3123
	α Aquilæ W.	43 58 22	4064	45 8 59	4013	46 20 26	3966	47 32 39	3923
	SATURN W.	15 29 36	3185	16 56 3	3166	18 22 53	3150	19 50 2	3138
	JUPITER E.	45 52 12	3138	44 24 49	3138	42 57 25	3138	41 30 1	3136
	α Arietis E.	60 15 1	3227	58 49 24	3233	57 23 54	3237	55 58 29	3243
	SUN E.	98 5 1	3450	96 43 41	3450	95 22 21	3448	94 0 59	3447
6	α Aquilæ W.	53 43 44	3747	54 59 41	3718	56 16 9	3691	57 33 6	3665
	SATURN W.	27 9 8	3090	28 37 30	3082	30 6 2	3074	31 34 44	3066
	JUPITER E.	34 12 26	3123	32 44 44	3119	31 16 58	3115	29 49 6	3110
	α Arietis E.	48 52 56	3271	47 28 10	3277	46 3 31	3283	44 39 0	3292
	SUN E.	87 13 36	3432	85 51 56	3428	84 30 11	3423	83 8 21	3418
7	α Aquilæ W.	64 4 29	3549	65 23 59	3528	66 43 52	3508	68 4 7	3489
	SATURN W.	39 0 43	3023	40 30 27	3014	42 0 22	3005	43 30 29	2995
	α Arietis E.	37 39 14	3352	36 16 2	3370	34 53 11	3391	33 30 44	3416
	SUN E.	76 17 29	3384	74 54 54	3376	73 32 10	3367	72 9 16	3358
8	α Aquilæ W.	74 50 39	3398	76 12 58	3381	77 35 36	3365	78 58 33	3348
	SATURN W.	51 4 15	2942	52 35 41	2931	54 7 21	2918	55 39 17	2906
	Fomalhaut W.	43 10 44	3754	44 26 34	3698	45 43 23	3648	47 1 6	3600
	α Pegasi W.	28 40 17	4242	29 48 4	4112	30 57 54	3998	32 9 36	3897
	SUN E.	65 12 0	3307	63 47 56	3295	62 23 39	3284	60 59 9	3272

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XV <sup>h</sup>	P. L. of Diff.	XVIII <sup>h</sup>	P. L. of Diff.	XXI <sup>h</sup>	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
1	Spica W.	91 53 34	2913	93 25 37	2923	94 57 27	2934	96 29 3	2944
	Antares W.	46 38 3	3009	48 8 5	3015	49 37 59	3021	51 7 46	3026
	SATURN E.	27 15 36	2946	25 44 15	2962	24 13 14	2979	22 42 35	2998
	Fomalhaut E.	45 20 2	3693	44 3 7	3748	42 47 11	3809	41 32 18	3875
	α Pegasi E.	58 19 49	3255	56 54 45	3278	55 30 8	3303	54 6 0	3328
	JUPITER E.	87 14 16	2970	85 43 25	2981	84 12 48	2991	82 42 24	3001
	α Arietis E.	101 4 44	3022	99 34 58	3032	98 5 25	3041	96 36 3	3051
2	Spica W.	104 3 58	2991	105 34 22	2999	107 4 36	3007	108 34 40	3015
	Antares W.	58 34 51	3056	60 3 54	3063	61 32 49	3069	63 1 37	3074
	α Pegasi E.	47 13 2	3474	45 52 9	3509	44 31 55	3545	43 12 21	3585
	JUPITER E.	75 13 26	3048	73 44 12	3056	72 15 9	3064	70 46 15	3072
	α Arietis E.	89 12 4	3096	87 43 49	3104	86 15 44	3113	84 47 50	3120
	SUN E.	125 24 15	3359	124 1 12	3368	122 38 19	3376	121 15 35	3383
3	Antares W.	70 24 1	3099	71 52 12	3103	73 20 18	3106	74 48 20	3110
	α Pegasi E.	36 46 25	3839	35 32 3	3906	34 18 49	3980	33 6 50	4063
	JUPITER E.	63 24 0	3104	61 55 55	3110	60 27 57	3115	59 0 5	3119
	α Arietis E.	77 30 41	3158	76 3 42	3165	74 36 51	3172	73 10 9	3178
	SUN E.	114 23 56	3416	113 1 58	3422	111 40 6	3426	110 18 19	3431
4	Antares W.	82 7 33	3123	83 35 15	3124	85 2 56	3124	86 30 36	3124
	JUPITER E.	51 41 55	3134	50 14 27	3136	48 47 1	3137	47 19 36	3138
	α Arietis E.	65 58 25	3208	64 32 25	3213	63 6 31	3218	61 40 43	3223
	SUN E.	103 30 30	3446	102 9 6	3447	100 47 43	3449	99 26 22	3449
5	Antares W.	93 48 57	3122	95 16 40	3119	96 44 26	3118	98 12 14	3115
	α Aquilæ W.	48 45 36	3883	49 59 13	3846	51 13 28	3811	52 28 19	3778
	SATURN W.	21 17 26	3126	22 45 4	3115	24 12 55	3107	25 40 56	3098
	JUPITER E.	40 2 35	3134	38 35 7	3133	37 7 37	3129	35 40 3	3127
	α Arietis E.	54 33 11	3248	53 7 58	3253	51 42 51	3258	50 17 50	3264
	SUN E.	92 39 35	3446	91 18 10	3443	89 56 42	3410	88 35 11	3437
6	α Aquilæ W.	58 50 30	3639	60 8 22	3615	61 26 40	3593	62 45 22	3570
	SATURN E.	33 3 35	3057	34 32 37	3049	36 1 49	3041	37 31 11	3033
	JUPITER E.	28 21 9	3105	26 53 5	3100	25 24 55	3093	23 56 37	3087
	α Arietis E.	43 14 39	3301	41 50 29	3311	40 26 30	3322	39 2 44	3336
	SUN E.	81 46 25	3413	80 24 23	3406	79 2 13	3399	77 39 55	3392
7	α Aquilæ W.	69 24 44	3470	70 45 42	3451	72 7 1	3433	73 28 40	3416
	SATURN W.	45 0 48	2985	46 31 20	2974	48 2 5	2964	49 33 3	2953
	α Arietis E.	32 8 45	3444	30 47 18	3479	29 26 30	3520	28 6 28	3570
	SUN E.	70 46 11	3349	69 22 56	3339	67 59 29	3329	66 35 51	3318
8	α Aquilæ W.	80 21 49	3332	81 45 23	3316	83 9 16	3301	84 33 26	3286
	SATURN W.	57 11 28	2894	58 43 55	2880	60 16 39	2868	61 49 39	2855
	Fomalhaut W.	48 19 40	3555	49 39 4	3513	50 59 14	3472	52 20 9	3434
	α Pegasi W.	33 22 59	3806	34 37 55	3724	35 54 17	3649	37 11 58	3582
	SUN E.	59 34 25	3259	58 9 26	3247	56 44 12	3234	55 18 43	3221

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
9	$\alpha$ Aquilæ W.	85 57 54	3271	87 22 39	3257	88 47 41	3243	90 12 59	3230
	SATURN W.	63 22 56	2841	64 56 31	2828	66 30 23	2814	68 4 33	2800
	Fomalhaut W.	53 41 47	3398	55 4 6	3364	56 27 4	3331	57 50 40	3299
	$\alpha$ Pegasi W.	38 30 52	3520	39 50 54	3463	41 11 59	3411	42 34 3	3362
	SUN E.	53 52 59	3208	52 26 59	3195	51 0 44	3181	49 34 12	3168
10	$\alpha$ Aquilæ W.	97 23 22	3168	98 50 9	3158	100 17 9	3148	101 44 21	3138
	SATURN W.	76 0 3	2727	77 36 7	2713	79 12 30	2698	80 49 13	2682
	Fomalhaut W.	64 57 27	3158	66 24 26	3133	67 51 56	3108	69 19 56	3085
	$\alpha$ Pegasi W.	49 37 20	3160	51 4 17	3126	52 31 55	3094	54 0 12	3065
	JUPITER W.	14 8 11	2801	15 42 38	2783	17 17 28	2766	18 52 41	2749
	SUN E.	42 17 25	3099	40 49 14	3086	39 20 47	3072	37 52 3	3059
11	SATURN W.	88 57 53	2607	90 36 38	2593	92 15 43	2577	93 55 9	2563
	Fomalhaut W.	76 46 50	2978	78 17 31	2958	79 48 36	2939	81 20 5	2922
	$\alpha$ Pegasi W.	61 30 38	2927	63 2 23	2903	64 34 38	2880	66 7 23	2857
	JUPITER W.	26 54 10	2669	28 31 32	2653	30 9 15	2638	31 47 19	2623
	SUN E.	30 24 33	3002	28 54 22	2993	27 24 0	2985	25 53 28	2978
15	SUN W.	21 53 43	2660	23 31 17	2640	25 9 18	2623	26 47 42	2608
	Regulus E.	43 24 35	2253	41 37 26	2249	39 50 11	2244	38 2 49	2241
	Spica E.	96 58 17	2258	95 11 15	2252	93 24 5	2247	91 36 48	2243
16	SUN W.	35 3 48	2561	36 43 36	2556	38 23 31	2551	40 3 33	2548
	Regulus E.	29 5 1	2233	27 17 22	2233	25 29 44	2235	23 42 8	2237
	Spica E.	82 38 59	2228	80 51 13	2226	79 3 24	2225	77 15 33	2224
17	SUN W.	48 24 46	2538	50 5 6	2538	51 45 27	2538	53 25 48	2539
	Spica E.	68 16 14	2227	66 28 26	2228	64 40 40	2229	62 52 56	2232
18	SUN W.	61 47 0	2549	63 27 5	2552	65 7 6	2556	66 47 2	2560
	Spica E.	53 55 25	2249	52 8 11	2254	50 21 4	2260	48 34 5	2265
	Antares E.	99 40 51	2289	97 54 35	2292	96 8 24	2296	94 22 18	2299
19	SUN W.	75 5 14	2583	76 44 33	2588	78 23 44	2593	80 2 48	2599
	Regulus W.	14 23 12	2324	16 8 37	2318	17 54 11	2313	19 39 51	2313
	Spica E.	39 41 20	2298	37 55 18	2306	36 9 27	2315	34 23 50	2324
	Antares E.	85 33 17	2323	83 47 51	2328	82 2 33	2334	80 17 23	2340
20	SUN W.	88 16 5	2630	89 54 19	2638	91 32 23	2644	93 10 18	2651
	Regulus W.	28 27 49	2326	30 13 11	2331	31 58 26	2335	33 43 34	2341
	Spica E.	25 39 37	2389	23 55 46	2406	22 12 20	2428	20 29 25	2453
	Antares E.	71 33 57	2375	69 49 47	2383	68 5 48	2391	66 22 0	2400
21	SUN W.	101 17 30	2688	102 54 26	2695	104 31 13	2703	106 7 49	2711
	Regulus W.	42 27 14	2370	44 11 32	2376	45 55 41	2383	47 39 40	2389
	Antares E.	57 46 11	2446	56 3 42	2457	54 21 28	2467	52 39 29	2479
	$\alpha$ Aquilæ E.	106 5 12	2835	104 31 29	2835	102 57 47	2835	101 24 4	2837
22	SUN W.	114 8 11	2751	115 43 43	2760	117 19 4	2768	118 54 14	2776
	Regulus W.	56 17 13	2424	58 0 13	2431	59 43 4	2438	61 25 45	2446
	Antares E.	44 13 52	2546	42 33 42	2561	40 53 54	2579	39 14 30	2597
	$\alpha$ Aquilæ E.	93 36 24	2857	92 3 10	2863	90 30 4	2870	88 57 7	2878

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV <sup>h</sup>	P. L. of Diff.	XVIII <sup>h</sup>	P. L. of Diff.	XXI <sup>h</sup>	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
9	<i>α</i> Aquilæ	W.	91 38 33	3216	93 4 23	3204	94 30 28	3191	95 56 48	3179
	SATURN	W.	69 39 1	2785	71 13 48	2771	72 48 54	2757	74 24 19	2742
	Fomalhaut	W.	59 14 53	3269	60 39 41	3240	62 5 3	3211	63 30 59	3184
	<i>α</i> Pegasi	W.	43 57 3	3317	45 20 55	3274	46 45 37	3234	48 11 6	3196
	SUN	E.	48 7 24	3153	46 40 19	3140	45 12 58	3126	43 45 20	3112
10	<i>α</i> Aquilæ	W.	103 11 45	3129	104 39 19	3121	106 7 3	3114	107 34 56	3109
	SATURN	W.	82 26 17	2667	84 3 41	2652	85 41 25	2638	87 19 29	2623
	Fomalhaut	W.	70 48 24	3062	72 17 20	3039	73 46 44	3018	75 16 34	2998
	<i>α</i> Pegasi	W.	55 29 7	3034	56 58 38	3005	58 28 45	2978	59 59 25	2952
	JUPITER	W.	20 28 16	2733	22 4 12	2717	23 40 30	2701	25 17 9	2684
	SUN	E.	36 23 3	3047	34 53 48	3034	33 24 17	3022	31 54 32	3011
11	SATURN	W.	95 34 55	2549	97 15 0	2534	98 55 26	2520	100 36 12	2505
	Fomalhaut	W.	82 51 56	2904	84 24 10	2888	85 56 44	2872	87 29 39	2857
	<i>α</i> Pegasi	W.	67 40 37	2835	69 14 19	2815	70 48 27	2795	72 23 2	2776
	JUPITER	W.	33 25 43	2607	35 4 28	2592	36 43 34	2577	38 23 0	2563
	SUN	E.	24 22 48	2975	22 52 4	2974	21 21 18	2977	19 50 36	2983
15	SUN	W.	28 26 26	2596	30 5 27	2585	31 44 42	2576	33 24 10	2569
	Regulus	E.	36 15 22	2238	34 27 51	2236	32 40 17	2234	30 52 40	2233
	Spica	E.	89 49 25	2239	88 1 55	2236	86 14 21	2233	84 26 42	2230
16	SUN	W.	41 43 40	2544	43 23 52	2541	45 4 8	2540	46 44 26	2538
	Regulus	E.	21 54 36	2241	20 7 10	2247	18 19 53	2256	16 32 48	2267
	Spica	E.	75 27 41	2224	73 39 49	2224	71 51 57	2224	70 4 5	2225
17	SUN	W.	55 6 7	2540	56 46 24	2542	58 26 39	2543	60 6 52	2547
	Spica	E.	61 5 16	2235	59 17 41	2238	57 30 10	2242	55 42 45	2245
18	SUN	W.	68 26 52	2564	70 6 37	2568	71 46 16	2573	73 25 48	2577
	Spica	E.	46 47 14	2270	45 0 31	2277	43 13 57	2283	41 27 33	2291
	Antares	E.	92 36 17	2303	90 50 22	2307	89 4 33	2312	87 18 51	2318
19	SUN	W.	81 41 44	2605	83 20 32	2611	84 59 12	2618	86 37 43	2624
	Regulus	W.	21 25 32	2314	23 11 11	2315	24 56 48	2318	26 42 21	2322
	Spica	E.	32 38 26	2335	30 53 17	2346	29 8 25	2359	27 23 51	2373
	Antares	E.	78 32 22	2347	76 47 31	2353	75 2 49	2361	73 18 18	2368
20	SUN	W.	94 48 4	2658	96 25 40	2666	98 3 6	2672	99 40 23	2680
	Regulus	W.	35 28 34	2346	37 13 27	2352	38 58 11	2357	40 42 47	2364
	Spica	E.	18 47 6	2485	17 5 31	2525	15 24 53	2577	13 45 27	2649
	Antares	E.	64 38 25	2408	62 55 2	2417	61 11 52	2427	59 28 55	2436
21	SUN	W.	107 44 14	2719	109 20 29	2726	110 56 34	2735	112 32 28	2743
	Regulus	W.	49 23 30	2396	51 7 10	2403	52 50 41	2410	54 34 2	2417
	Antares	E.	50 57 46	2491	49 16 20	2504	47 35 12	2517	45 54 22	2531
	<i>α</i> Aquilæ	E.	99 50 24	2839	98 16 47	2842	96 43 14	2846	95 9 46	2851
22	SUN	W.	120 29 13	2785	122 4 0	2795	123 38 35	2803	125 12 59	2812
	Regulus	W.	63 8 15	2453	64 50 35	2460	66 32 44	2467	68 14 43	2475
	Antares	E.	37 35 31	2617	35 56 59	2640	34 18 58	2664	32 41 30	2690
	<i>α</i> Aquilæ	E.	87 24 20	2887	85 51 45	2897	84 19 22	2906	82 47 11	2918

GREENWICH MEAN TIME.										
LUNAR DISTANCES.										
Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
23	SUN	W.	° ' "		° ' "		° ' "		° ' "	
	Regulus	W.	126 47 11	2821	128 21 11	2831	129 54 59	2841	131 28 34	2851
	Spica	W.	69 56 31	2482	71 38 9	2490	73 19 36	2498	75 0 52	2506
	Antares	E.	16 53 37	2632	18 31 48	2615	20 10 22	2604	21 49 11	2596
	α Aquilæ	E.	31 4 37	2721	29 28 25	2757	27 53 0	2795	26 18 26	2842
	SATURN	E.	81 15 15	2929	79 43 33	2942	78 12 8	2956	76 41 0	2970
24	Regulus	W.	102 12 47	2476	100 31 0	2484	98 49 24	2492	97 7 59	2499
	Spica	W.	83 24 28	2546	85 4 38	2553	86 44 37	2562	88 24 24	2571
	α Aquilæ	E.	30 4 38	2594	31 43 41	2599	33 22 38	2602	35 1 30	2607
	SATURN	E.	69 10 14	3057	67 41 12	3078	66 12 35	3100	64 44 25	3124
	Fomalhaut	E.	88 43 36	2538	87 3 16	2547	85 23 8	2555	83 43 11	2564
		E.	101 26 21	2906	99 54 10	2911	98 22 5	2916	96 50 7	2922
25	Regulus	W.	96 40 26	2613	98 19 3	2622	99 57 28	2631	101 35 41	2639
	Spica	W.	43 13 59	2638	44 52 2	2645	46 29 56	2652	48 7 40	2660
	α Aquilæ	E.	57 31 21	3267	56 6 31	3301	54 42 21	3339	53 18 54	3379
	SATURN	E.	75 26 22	2606	73 47 35	2615	72 9 0	2624	70 30 38	2633
	Fomalhaut	E.	89 12 21	2961	87 41 19	2970	86 10 28	2980	84 39 50	2991
	α Pegasi	E.	104 13 24	2877	102 40 35	2882	101 7 53	2888	99 35 19	2894
26	Spica	W.	56 13 41	2701	57 50 20	2709	59 26 48	2718	61 3 4	2726
	SATURN	E.	62 21 50	2679	60 44 42	2689	59 7 47	2699	57 31 5	2708
	Fomalhaut	E.	77 10 15	3054	75 41 9	3068	74 12 20	3083	72 43 50	3099
	α Pegasi	E.	91 54 41	2934	90 23 5	2943	88 51 40	2953	87 20 28	2962
27	Spica	W.	69 1 29	2772	70 36 34	2781	72 11 27	2790	73 46 8	2799
	Antares	W.	24 41 32	3098	26 9 44	3072	27 38 28	3051	29 7 38	3034
	SATURN	E.	49 30 49	2757	47 55 25	2768	46 20 15	2779	44 45 19	2789
	Fomalhaut	E.	65 26 31	3192	64 0 12	3214	62 34 19	3236	61 8 52	3259
	α Pegasi	E.	79 47 44	3019	78 17 55	3031	76 48 21	3044	75 19 3	3058
	JUPITER	E.	114 36 44	2809	113 2 28	2818	111 28 24	2828	109 54 33	2838
28	Spica	W.	81 36 31	2846	83 9 59	2856	84 43 15	2865	86 16 19	2874
	Antares	W.	36 37 13	2997	38 7 30	2995	39 37 49	2994	41 8 9	2995
	SATURN	E.	36 54 4	2843	35 20 32	2854	33 47 14	2866	32 14 11	2878
	Fomalhaut	E.	54 9 5	3400	52 46 49	3433	51 25 10	3469	50 4 11	3507
	α Pegasi	E.	67 56 55	3134	66 29 26	3150	65 2 17	3168	63 35 29	3185
	JUPITER	E.	102 8 21	2886	100 35 44	2894	99 3 18	2904	97 31 4	2913
29	Spica	W.	93 58 44	2920	95 30 38	2928	97 2 22	2937	98 33 54	2946
	Antares	W.	48 39 15	3010	50 9 16	3014	51 39 12	3018	53 9 3	3022
	α Pegasi	E.	56 27 7	3288	55 2 41	3311	53 38 42	3336	52 15 12	3362
	JUPITER	E.	89 52 50	2958	88 21 45	2968	86 50 52	2976	85 20 9	2985
	α Arietis	E.	99 4 12	3030	97 34 36	3038	96 5 10	3045	94 35 53	3053
30	Antares	W.	60 36 43	3048	62 5 56	3054	63 35 2	3060	65 4 1	3065
	α Pegasi	E.	45 25 44	3518	44 5 40	3557	42 46 19	3599	41 27 43	3643
	JUPITER	E.	77 49 11	3025	76 19 29	3032	74 49 56	3039	73 20 32	3046
	α Arietis	E.	87 11 56	3093	85 43 38	3101	84 15 30	3109	82 47 32	3117

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XV <sup>h</sup>	P. L. of Diff.	XVIII <sup>h</sup>	P. L. of Diff.	XXI <sup>h</sup>	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
23	SUN W.	133 1 56	2860	134 35 6	2870	136 8 3	2881	137 40 46	2892
	Regulus W.	76 41 57	2513	78 22 52	2522	80 3 35	2530	81 44 7	2538
	Spica W.	23 28 11	2593	25 7 16	2591	26 46 24	2591	28 25 32	2592
	Antares E.	24 44 52	2896	23 12 28	2961	21 41 26	3039	20 12 2	3137
	α Aquilæ E.	75 10 10	2985	73 39 39	3002	72 9 29	3019	70 39 40	3038
	SATURN E.	95 26 44	2507	93 45 41	2515	92 4 48	2522	90 24 6	2531
24	Regulus W.	90 3 59	2579	91 43 23	2587	93 22 36	2596	95 1 37	2604
	Spica W.	36 40 16	2613	38 18 54	2618	39 57 24	2624	41 35 46	2631
	α Aquilæ E.	63 16 45	3148	61 49 34	3175	60 22 55	3204	58 56 50	3234
	SATURN E.	82 3 26	2572	80 23 52	2580	78 44 30	2589	77 5 20	2598
	Fomalhaut E.	95 18 16	2928	93 46 33	2935	92 14 59	2943	90 43 35	2951
25	Regulus W.	103 13 43	2649	104 51 32	2658	106 29 8	2666	108 6 33	2676
	Spica W.	49 45 13	2668	51 22 36	2675	52 59 49	2684	54 36 51	2693
	α Aquilæ E.	51 56 13	3422	50 34 21	3469	49 13 22	3519	47 53 19	3573
	SATURN E.	68 52 28	2642	67 14 30	2651	65 36 44	2661	63 59 11	2669
	Fomalhaut E.	83 9 26	3002	81 39 15	3014	80 9 19	3026	78 39 39	3039
	α Pegasi E.	98 2 53	2901	96 30 35	2909	94 58 27	2916	93 26 29	2924
26	Spica W.	62 39 9	2735	64 15 2	2744	65 50 43	2753	67 26 12	2763
	SATURN E.	55 54 36	2717	54 18 19	2728	52 42 16	2738	51 6 26	2747
	Fomalhaut E.	71 15 39	3116	69 47 49	3134	68 20 20	3153	66 53 14	3172
	α Pegasi E.	85 49 28	2973	84 18 41	2983	82 48 7	2995	81 17 48	3007
27	Spica W.	75 20 37	2809	76 54 53	2818	78 28 58	2827	80 2 51	2837
	Antares W.	30 37 9	3022	32 6 55	3012	33 36 53	3005	35 7 0	3000
	SATURN E.	43 10 36	2799	41 36 7	2810	40 1 52	2821	38 27 51	2832
	Fomalhaut E.	59 43 53	3284	58 19 23	3312	56 55 25	3339	55 31 58	3368
	α Pegasi E.	73 50 2	3072	72 21 18	3087	70 52 52	3101	69 24 44	3117
	JUPITER E.	108 20 54	2848	106 47 28	2857	105 14 14	2866	103 41 11	2876
28	Spica W.	87 49 11	2883	89 21 52	2892	90 54 21	2902	92 26 38	2910
	Antares W.	42 38 28	2997	44 8 44	2999	45 38 58	3002	47 9 9	3006
	SATURN E.	30 41 24	2890	29 8 52	2903	27 36 37	2916	26 4 38	2930
	Fomalhaut E.	48 43 54	3547	47 24 22	3591	46 5 38	3638	44 47 45	3690
	α Pegasi E.	62 9 2	3204	60 42 57	3224	59 17 16	3244	57 51 59	3265
	JUPITER E.	95 59 2	2923	94 27 12	2931	92 55 33	2941	91 24 6	2950
29	Spica W.	100 5 15	2954	101 36 25	2962	103 7 25	2970	104 38 15	2978
	Antares W.	54 38 48	3028	56 8 26	3033	57 37 58	3038	59 7 24	3043
	α Pegasi E.	50 52 12	3389	49 29 43	3419	48 7 48	3449	46 46 27	3483
	JUPITER E.	83 49 37	2993	82 19 15	3002	80 49 4	3009	79 19 2	3018
	α Arietis E.	93 6 46	3061	91 37 49	3069	90 9 2	3077	88 40 24	3085
30	Antares W.	66 32 54	3069	68 1 41	3074	69 30 22	3080	70 58 56	3085
	α Pegasi E.	40 9 55	3692	38 52 59	3746	37 37 0	3804	36 22 2	3869
	JUPITER E.	71 51 16	3054	70 22 10	3060	68 53 11	3066	67 24 20	3072
	α Arietis E.	81 19 43	3125	79 52 4	3133	78 24 34	3140	76 57 13	3148

## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S						Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.				
		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>'</sup> <sup>"</sup>	<sup>s</sup>	<sup>m</sup> <sup>s</sup>	<sup>s</sup>	
Frid.	1	6 39 58.45	10.339	N.23 7 51.3	- 9.88	15 45.67	68.76	3 31.70	0.482	
Sat.	2	6 44 6.48	10.329	23 3 42.1	10.89	15 45.66	68.72	3 43.14	0.472	
SUN.	3	6 48 14.26	10.318	22 59 8.8	11.89	15 45.65	68.68	3 54.33	0.461	
Mon.	4	6 52 21.76	10.306	22 54 11.4	- 12.89	15 45.64	68.64	4 5.25	0.449	
Tues.	5	6 56 28.96	10.294	22 48 50.0	13.89	15 45.64	68.60	4 15.87	0.436	
Wed.	6	7 0 35.86	10.280	22 43 4.8	14.88	15 45.65	68.55	4 26.17	0.423	
Thur.	7	7 4 42.42	10.266	22 36 56.0	- 15.86	15 45.66	68.50	4 36.15	0.409	
Frid.	8	7 8 48.62	10.251	22 30 23.6	16.84	15 45.67	68.44	4 45.78	0.394	
Sat.	9	7 12 54.46	10.235	22 23 27.8	17.81	15 45.69	68.38	4 55.03	0.378	
SUN.	10	7 16 59.91	10.218	22 16 8.8	- 18.77	15 45.71	68.32	5 3.89	0.361	
Mon.	11	7 21 4.94	10.201	22 8 26.9	19.72	15 45.74	68.26	5 12.35	0.343	
Tues.	12	7 25 9.54	10.182	22 0 22.0	20.67	15 45.78	68.20	5 20.38	0.325	
Wed.	13	7 29 13.69	10.163	21 51 54.5	- 21.61	15 45.82	68.13	5 27.95	0.306	
Thur.	14	7 33 17.37	10.143	21 43 4.6	22.54	15 45.87	68.07	5 35.05	0.286	
Frid.	15	7 37 20.56	10.122	21 33 52.5	23.46	15 45.92	68.00	5 41.66	0.265	
Sat.	16	7 41 23.23	10.100	21 24 18.3	- 24.37	15 45.98	67.93	5 47.76	0.243	
SUN.	17	7 45 25.38	10.078	21 14 22.3	25.28	15 46.04	67.86	5 53.34	0.221	
Mon.	18	7 49 26.98	10.055	21 4 4.8	26.19	15 46.11	67.79	5 58.38	0.198	
Tues.	19	7 53 28.03	10.032	20 53 25.8	- 27.06	15 46.18	67.71	6 2.86	0.175	
Wed.	20	7 57 28.52	10.008	20 42 25.8	27.94	15 46.26	67.64	6 6.78	0.151	
Thur.	21	8 1 28.42	9.984	20 31 4.9	28.80	15 46.34	67.56	6 10.11	0.127	
Frid.	22	8 5 27.75	9.960	20 19 23.4	- 29.66	15 46.43	67.48	6 12.87	0.103	
Sat.	23	8 9 26.49	9.935	20 7 21.4	30.50	15 46.52	67.40	6 15.05	0.079	
SUN.	24	8 13 24.63	9.910	19 54 59.4	31.33	15 46.61	67.32	6 16.64	0.054	
Mon.	25	8 17 22.18	9.885	19 42 17.4	- 32.16	15 46.71	67.23	6 17.62	0.029	
Tues.	26	8 21 19.13	9.860	19 29 15.8	32.97	15 46.81	67.14	6 18.02	0.004	
Wed.	27	8 25 15.48	9.836	19 15 54.8	33.78	15 46.91	67.05	6 17.82	0.021	
Thur.	28	8 29 11.24	9.811	19 2 14.6	- 34.57	15 47.02	66.97	6 17.03	0.046	
Frid.	29	8 33 6.40	9.786	18 48 15.6	35.34	15 47.13	66.88	6 15.63	0.071	
Sat.	30	8 37 0.96	9.761	18 33 58.1	36.11	15 47.23	66.80	6 13.64	0.095	
SUN.	31	8 40 54.92	9.736	18 19 22.2	36.87	15 47.34	66.71	6 11.06	0.120	
Mon.	32	8 44 48.29	9.711	N.18 4 28.2	- 37.62	15 47.46	66.63	6 7.89	0.145	

NOTE.—The mean time of semidiameter passing the meridian may be found by subtracting 0.19 from the sidereal time.  
The sign - prefixed to the hourly change of declination indicates that north declinations are decreasing.



## AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ' "	"	m s	s	h m s
Frid.	1	6 39 57.84	10.338	N.23 7 51.9	- 9.87	3 31.67	0.482	6 36 26.17
Sat.	2	6 44 5.84	10.328	23 3 42.8	10.88	3 43.11	0.472	6 40 22.73
SUN.	3	6 48 13.59	10.317	22 59 9.6	11.89	3 54.30	0.461	6 44 19.28
Mon.	4	6 52 21.06	10.305	22 54 12.2	- 12.89	4 5.22	0.449	6 48 15.84
Tues.	5	6 56 28.23	10.293	22 48 51.0	13.88	4 15.84	0.436	6 52 12.40
Wed.	6	7 0 35.10	10.279	22 43 5.9	14.87	4 26.14	0.422	6 56 8.95
Thur.	7	7 4 41.63	10.265	22 36 57.2	- 15.85	4 36.12	0.408	7 0 5.51
Frid.	8	7 8 47.81	10.250	22 30 24.9	16.83	4 45.75	0.393	7 4 2.07
Sat.	9	7 12 53.62	10.234	22 23 29.3	17.80	4 55.00	0.377	7 7 58.62
SUN.	10	7 16 59.04	10.218	22 16 10.4	- 18.76	5 3.86	0.361	7 11 55.18
Mon.	11	7 21 4.06	10.200	22 8 28.6	19.72	5 12.32	0.344	7 15 51.74
Tues.	12	7 25 8.64	10.182	22 0 23.8	20.67	5 20.35	0.325	7 19 48.29
Wed.	13	7 29 12.77	10.162	21 51 56.5	- 21.61	5 27.92	0.306	7 23 44.85
Thur.	14	7 33 16.43	10.142	21 43 6.7	22.54	5 35.02	0.286	7 27 41.40
Frid.	15	7 37 19.60	10.122	21 33 54.7	23.46	5 41.64	0.265	7 31 37.96
Sat.	16	7 41 22.26	10.100	21 24 20.6	- 24.38	5 47.74	0.243	7 35 34.52
SUN.	17	7 45 24.39	10.078	21 14 24.8	25.28	5 53.32	0.221	7 39 31.07
Mon.	18	7 49 25.98	10.055	21 4 7.4	26.17	5 58.36	0.198	7 43 27.63
Tues.	19	7 53 27.02	10.032	20 53 28.6	- 27.06	6 2.84	0.175	7 47 24.18
Wed.	20	7 57 27.50	10.008	20 42 28.6	27.93	6 6.76	0.151	7 51 20.74
Thur.	21	8 1 27.40	9.984	20 31 7.9	28.80	6 10.10	0.127	7 55 17.30
Frid.	22	8 5 26.72	9.960	20 19 26.5	- 29.65	6 12.86	0.103	7 59 13.85
Sat.	23	8 9 25.45	9.935	20 7 24.6	30.50	6 15.04	0.079	8 3 10.41
SUN.	24	8 13 23.59	9.910	19 55 2.7	31.33	6 16.63	0.054	8 7 6.96
Mon.	25	8 17 21.14	9.885	19 42 20.8	- 32.16	6 17.62	0.029	8 11 3.52
Tues.	26	8 21 18.09	9.861	19 29 19.2	32.97	6 18.02	0.004	8 15 0.07
Wed.	27	8 25 14.45	9.836	19 15 58.3	33.77	6 17.82	0.021	8 18 56.63
Thur.	28	8 29 10.21	9.811	19 2 18.3	- 34.56	6 17.03	0.045	8 22 53.18
Frid.	29	8 33 5.38	9.786	18 48 19.3	35.34	6 15.64	0.070	8 26 49.74
Sat.	30	8 36 59.94	9.761	18 34 1.8	36.11	6 13.65	0.095	8 30 46.29
SUN.	31	8 40 53.92	9.737	18 19 26.0	36.87	6 11.07	0.120	8 34 42.85
Mon.	32	8 44 47.30	9.712	N.18 4 32.1	- 37.62	6 7.90	0.145	8 38 39.40

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.  
 The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing.

Diff. for 1 Hour,  
 +9".8565.  
 (Table III.)

AT GREENWICH MEAN NOON.								
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		$\lambda$	$\lambda'$					
		° ' "	° ' "	"	"			h m s
1	183	99 11 10.1	10 47.1	142.95	+ 0.14	0.007 2095	+ 2.7	17 20 42.87
2	184	100 8 21.0	7 57.8	142.96	+ 0.03	0.007 2150	2.0	17 16 46.96
3	185	101 5 32.0	5 8.7	142.96	— 0.09	0.007 2188	1.2	17 12 51.05
4	186	102 2 43.3	2 19.8	142.97	— 0.21	0.007 2208	+ 0.4	17 8 55.13
5	187	102 59 54.8	59 31.2	142.99	0.32	0.007 2209	— 0.4	17 4 59.22
6	188	103 57 6.7	56 42.9	143.00	0.43	0.007 2190	1.2	17 1 3.31
7	189	104 54 18.9	53 55.0	143.02	— 0.52	0.007 2151	— 2.1	16 57 7.40
8	190	105 51 31.5	51 7.4	143.03	0.60	0.007 2087	3.1	16 53 11.49
9	191	106 48 44.5	48 20.2	143.05	0.66	0.007 2003	4.1	16 49 15.58
10	192	107 45 57.9	45 33.5	143.07	— 0.67	0.007 1894	— 5.1	16 45 19.67
11	193	108 43 11.7	42 47.2	143.08	0.66	0.007 1758	6.2	16 41 23.76
12	194	109 40 25.9	40 1.2	143.10	0.62	0.007 1597	7.3	16 37 27.85
13	195	110 37 40.4	37 15.5	143.11	— 0.55	0.007 1408	— 8.4	16 33 31.94
14	196	111 34 55.2	34 30.2	143.12	0.46	0.007 1193	9.5	16 29 36.03
15	197	112 32 10.2	31 45.1	143.13	0.34	0.007 0951	10.6	16 25 40.12
16	198	113 29 25.5	29 0.2	143.14	— 0.21	0.007 0683	— 11.7	16 21 44.21
17	199	114 26 40.9	26 15.5	143.15	— 0.07	0.007 0391	12.7	16 17 48.30
18	200	115 23 56.5	23 31.0	143.15	+ 0.07	0.007 0075	13.6	16 13 52.39
19	201	116 21 12.3	20 46.6	143.16	+ 0.21	0.006 9736	— 14.5	16 9 56.48
20	202	117 18 28.3	18 2.5	143.17	0.32	0.006 9378	15.3	16 6 0.57
21	203	118 15 44.6	15 18.5	143.18	0.42	0.006 9000	16.1	16 2 4.66
22	204	119 13 1.1	12 34.9	143.20	+ 0.48	0.006 8605	— 16.8	15 58 8.75
23	205	120 10 17.9	9 51.6	143.21	0.52	0.006 8194	17.5	15 54 12.84
24	206	121 7 35.3	7 8.8	143.23	0.53	0.006 7767	18.1	15 50 16.93
25	207	122 4 53.1	4 26.5	143.25	+ 0.50	0.006 7326	— 18.7	15 46 21.02
26	208	123 2 11.5	1 44.7	143.28	0.45	0.006 6870	19.3	15 42 25.11
27	209	123 59 30.6	59 3.7	143.31	0.38	0.006 6401	19.8	15 38 29.20
28	210	124 56 50.4	56 23.4	143.34	+ 0.29	0.006 5918	— 20.4	15 34 33.29
29	211	125 54 11.1	53 44.0	143.38	0.18	0.006 5421	21.0	15 30 37.38
30	212	126 51 32.7	51 5.4	143.42	+ 0.06	0.006 4911	21.6	15 26 41.48
31	213	127 48 55.2	48 27.3	143.46	— 0.06	0.006 4386	22.2	15 22 45.57
32	214	128 46 18.9	45 51.4	143.51	— 0.18	0.006 3846	— 22.8	15 18 49.66

NOTE.—The longitudes in the column  $\lambda$  are referred to the true equinox of their own date, while those in the column  $\lambda'$  are referred to the mean equinox of the beginning of the Besselian fictitious year.

Diff. for 1 Hour,  
— 9<sup>s</sup>.8296.  
(Table II.)

## GREENWICH MEAN TIME.

## THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	"	"	"	"	"	"	h m	m	d
1	14 50.7	14 49.0	54 22.9	- 0.58	54 16.8	- 0.43	15 19.8	1.84	17.6
2	14 47.9	14 47.3	54 12.6	- 0.26	54 10.5	- 0.08	16 3.1	1.79	18.6
3	14 47.4	14 48.1	54 10.7	+ 0.11	54 13.2	+ 0.31	16 45.7	1.77	19.6
4	14 49.4	14 51.4	54 18.1	+ 0.51	54 25.5	+ 0.72	17 28.2	1.78	20.6
5	14 54.1	14 57.5	54 35.4	0.93	54 47.9	1.14	18 11.3	1.82	21.6
6	15 1.6	15 6.3	55 2.8	1.34	55 20.0	1.53	18 55.8	1.90	22.6
7	15 11.5	15 17.4	55 39.4	+ 1.70	56 0.8	+ 1.85	19 42.6	2.01	23.6
8	15 23.7	15 30.3	56 23.9	1.98	56 48.3	2.08	20 32.3	2.14	24.6
9	15 37.2	15 44.3	57 13.8	2.14	57 39.8	2.16	21 25.3	2.27	25.6
10	15 51.4	15 58.3	58 5.7	+ 2.14	58 31.2	+ 2.08	22 21.3	2.39	26.6
11	16 4.9	16 11.1	58 55.5	1.95	59 18.2	1.79	23 19.6	2.46	27.6
12	16 16.7	16 21.5	59 38.6	1.58	59 56.2	1.33	6		28.6
13	16 25.4	16 28.3	60 10.6	+ 1.05	60 21.4	+ 0.75	0 19.0	2.47	0.3
14	16 30.2	16 31.1	60 28.5	+ 0.43	60 31.8	+ 0.11	1 18.1	2.43	1.3
15	16 31.0	16 29.8	60 31.2	- 0.20	60 27.0	- 0.49	2 15.6	2.36	2.3
16	16 27.8	16 24.9	60 19.5	- 0.75	60 9.0	- 0.98	3 11.2	2.28	3.3
17	16 21.4	16 17.2	59 55.9	1.18	59 40.7	1.34	4 4.9	2.21	4.3
18	16 12.6	16 7.7	59 23.8	1.45	59 5.7	1.53	4 57.1	2.16	5.3
19	16 2.6	15 57.3	58 46.8	- 1.59	58 27.5	- 1.62	5 48.5	2.13	6.3
20	15 52.0	15 46.7	58 8.0	1.62	57 48.7	1.60	6 39.6	2.13	7.3
21	15 41.6	15 36.5	57 29.7	1.56	57 11.2	1.51	7 30.8	2.14	8.3
22	15 31.7	15 27.0	56 53.3	- 1.46	56 36.1	- 1.40	8 22.2	2.14	9.3
23	15 22.5	15 18.2	56 19.6	1.34	56 3.9	1.28	9 13.6	2.14	10.3
24	15 14.1	15 10.3	55 49.0	1.21	55 34.9	1.14	10 4.6	2.11	11.3
25	15 6.7	15 3.3	55 21.5	- 1.07	55 9.0	- 1.00	10 54.8	2.06	12.3
26	15 0.1	14 57.2	54 57.3	0.93	54 46.6	0.85	11 43.6	2.00	13.3
27	14 54.5	14 52.1	54 36.8	0.77	54 28.0	0.68	12 30.7	1.93	14.3
28	14 50.0	14 48.3	54 20.4	- 0.58	54 14.0	- 0.48	13 16.1	1.86	15.3
29	14 46.9	14 45.9	54 8.9	0.36	54 5.3	- 0.23	14 0.0	1.81	16.3
30	14 45.3	14 45.3	54 3.2	- 0.10	54 2.9	+ 0.03	14 42.8	1.77	17.3
31	14 45.7	14 46.6	54 4.5	+ 0.21	54 8.0	0.38	15 25.1	1.76	18.3
32	14 48.2	14 50.3	54 13.6	+ 0.56	54 21.4	+ 0.74	16 7.6	1.78	19.3

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 1.					SUNDAY 3.				
0	21 28 39.37	1.9807	S. 12 11 39.6	7.228	0	23 1 12.88	1.8896	S. 5 38 22.5	8.943
1	21 30 38.13	1.9780	12 4 24.5	7.277	1	23 3 6.23	1.8887	5 29 25.2	8.966
2	21 32 36.73	1.9754	11 57 6.4	7.326	2	23 4 59.52	1.8878	5 20 26.6	8.987
3	21 34 35.18	1.9728	11 49 45.4	7.374	3	23 6 52.76	1.8869	5 11 26.7	9.009
4	21 36 33.47	1.9702	11 42 21.5	7.422	4	23 8 45.95	1.8861	5 2 25.5	9.030
5	21 38 31.61	1.9677	11 34 54.8	7.468	5	23 10 39.09	1.8853	4 53 23.1	9.051
6	21 40 29.59	1.9652	11 27 25.4	7.513	6	23 12 32.18	1.8846	4 44 19.4	9.071
7	21 42 27.43	1.9627	11 19 53.2	7.560	7	23 14 25.24	1.8839	4 35 14.6	9.089
8	21 44 25.11	1.9602	11 12 18.2	7.605	8	23 16 18.25	1.8832	4 26 8.7	9.108
9	21 46 22.65	1.9577	11 4 40.6	7.649	9	23 18 11.23	1.8827	4 17 1.6	9.127
10	21 48 20.04	1.9553	10 57 0.3	7.693	10	23 20 4.18	1.8822	4 7 53.5	9.144
11	21 50 17.29	1.9530	10 49 17.4	7.737	11	23 21 57.09	1.8816	3 58 44.3	9.162
12	21 52 14.40	1.9507	10 41 31.9	7.779	12	23 23 49.97	1.8812	3 49 34.0	9.179
13	21 54 11.37	1.9483	10 33 43.9	7.821	13	23 25 42.83	1.8808	3 40 22.8	9.195
14	21 56 8.20	1.9460	10 25 53.4	7.862	14	23 27 35.67	1.8805	3 31 10.6	9.211
15	21 58 4.89	1.9437	10 18 0.4	7.904	15	23 29 28.49	1.8802	3 21 57.5	9.226
16	22 0 1.45	1.9415	10 10 4.9	7.945	16	23 31 21.29	1.8798	3 12 43.5	9.240
17	22 1 57.87	1.9393	10 2 7.0	7.984	17	23 33 14.07	1.8797	3 3 28.7	9.254
18	22 3 54.16	1.9372	9 54 6.8	8.023	18	23 35 6.85	1.8796	2 54 13.0	9.268
19	22 5 50.33	1.9351	9 46 4.3	8.062	19	23 36 59.62	1.8794	2 44 56.5	9.282
20	22 7 46.37	1.9329	9 37 59.4	8.100	20	23 38 52.38	1.8793	2 35 39.2	9.295
21	22 9 42.28	1.9308	9 29 52.3	8.137	21	23 40 45.14	1.8793	2 26 21.1	9.307
22	22 11 38.07	1.9288	9 21 42.9	8.175	22	23 42 37.90	1.8793	2 17 2.4	9.318
23	22 13 33.74	1.9268	S. 9 13 31.3	8.212	23	23 44 30.66	1.8794	S. 2 7 42.9	9.330
SATURDAY 2.					MONDAY 4.				
0	22 15 29.29	1.9248	S. 9 5 17.5	8.247	0	23 46 23.43	1.8796	S. 1 58 22.8	9.340
1	22 17 24.72	1.9229	8 57 1.6	8.282	1	23 48 16.21	1.8798	1 49 2.1	9.350
2	22 19 20.04	1.9211	8 48 43.6	8.317	2	23 50 9.00	1.8800	1 39 40.8	9.359
3	22 21 15.25	1.9192	8 40 23.5	8.352	3	23 52 1.81	1.8802	1 30 19.0	9.368
4	22 23 10.35	1.9174	8 32 1.4	8.385	4	23 53 54.63	1.8806	1 20 56.6	9.377
5	22 25 5.34	1.9156	8 23 37.3	8.418	5	23 55 47.48	1.8811	1 11 33.7	9.385
6	22 27 0.22	1.9139	8 15 11.2	8.451	6	23 57 40.36	1.8815	1 2 10.4	9.392
7	22 28 55.01	1.9122	8 6 43.2	8.482	7	23 59 33.26	1.8819	0 52 46.6	9.400
8	22 30 49.69	1.9105	7 58 13.3	8.514	8	0 1 26.19	1.8824	0 43 22.4	9.407
9	22 32 44.27	1.9089	7 49 41.5	8.545	9	0 3 19.15	1.8830	0 33 57.8	9.412
10	22 34 38.76	1.9073	7 41 7.9	8.575	10	0 5 12.15	1.8837	0 24 32.9	9.418
11	22 36 33.15	1.9057	7 32 32.5	8.605	11	0 7 5.19	1.8844	0 15 7.6	9.424
12	22 38 27.45	1.9042	7 23 55.3	8.634	12	0 8 58.28	1.8852	S. 0 5 42.0	9.428
13	22 40 21.66	1.9028	7 15 16.4	8.663	13	0 10 51.41	1.8859	N. 0 3 43.8	9.432
14	22 42 15.79	1.9015	7 6 35.7	8.692	14	0 12 44.59	1.8867	0 13 9.8	9.435
15	22 44 9.84	1.9001	6 57 53.4	8.718	15	0 14 37.82	1.8877	0 22 36.0	9.437
16	22 46 3.80	1.8987	6 49 9.5	8.746	16	0 16 31.11	1.8886	0 32 2.3	9.440
17	22 47 57.68	1.8974	6 40 23.9	8.772	17	0 18 24.45	1.8895	0 41 28.8	9.442
18	22 49 51.49	1.8962	6 31 36.8	8.798	18	0 20 17.85	1.8906	0 50 55.4	9.443
19	22 51 45.23	1.8950	6 22 48.1	8.824	19	0 22 11.32	1.8917	1 0 22.0	9.443
20	22 53 38.89	1.8938	6 13 57.9	8.849	20	0 24 4.86	1.8929	1 9 48.6	9.444
21	22 55 32.49	1.8927	6 5 6.2	8.874	21	0 25 58.47	1.8941	1 19 15.3	9.444
22	22 57 26.02	1.8916	5 56 13.0	8.898	22	0 27 52.15	1.8953	1 28 41.9	9.443
23	22 59 19.48	1.8905	5 47 18.4	8.921	23	0 29 45.91	1.8966	1 38 8.5	9.442
24	23 1 12.88	1.8896	S. 5 38 22.5	8.943	24	0 31 39.74	1.8979	N. 1 47 35.0	9.440

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 5.					THURSDAY 7.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	0 31 39.74	1.8979	N. 1 47 35.0	9.440	0	2 5 18.23	2.0232	N. 9 7 27.2	8.646
1	0 33 33.66	1.8993	1 57 1.3	9.437	1	2 7 19.74	2.0271	9 16 5.0	8.612
2	0 35 27.66	1.9008	2 6 27.5	9.435	2	2 9 21.48	2.0309	9 24 40.7	8.578
3	0 37 21.76	1.9023	2 15 53.5	9.431	3	2 11 23.45	2.0348	9 33 14.4	8.544
4	0 39 15.94	1.9038	2 25 19.2	9.427	4	2 13 25.66	2.0387	9 41 46.0	8.509
5	0 41 10.22	1.9055	2 34 44.7	9.422	5	2 15 28.10	2.0427	9 50 15.5	8.473
6	0 43 4.60	1.9072	2 44 9.9	9.417	6	2 17 30.78	2.0467	9 58 42.8	8.436
7	0 44 59.08	1.9089	2 53 34.7	9.411	7	2 19 33.71	2.0508	10 7 7.8	8.398
8	0 46 53.67	1.9107	3 2 59.2	9.405	8	2 21 36.88	2.0550	10 15 30.6	8.360
9	0 48 48.36	1.9124	3 12 23.3	9.398	9	2 23 40.31	2.0592	10 23 51.0	8.321
10	0 50 43.16	1.9143	3 21 46.9	9.390	10	2 25 43.98	2.0633	10 32 9.1	8.281
11	0 52 38.08	1.9162	3 31 10.1	9.382	11	2 27 47.90	2.0675	10 40 24.7	8.239
12	0 54 33.11	1.9182	3 40 32.8	9.374	12	2 29 52.08	2.0718	10 48 37.8	8.197
13	0 56 28.26	1.9202	3 49 55.0	9.365	13	2 31 56.52	2.0761	10 56 48.4	8.156
14	0 58 23.54	1.9224	3 59 16.6	9.355	14	2 34 1.21	2.0804	11 4 56.5	8.113
15	1 0 18.95	1.9246	4 8 37.6	9.344	15	2 36 6.17	2.0848	11 13 1.9	8.068
16	1 2 14.49	1.9267	4 17 57.9	9.333	16	2 38 11.39	2.0892	11 21 4.7	8.023
17	1 4 10.16	1.9289	4 27 17.6	9.322	17	2 40 16.88	2.0937	11 29 4.7	7.977
18	1 6 5.96	1.9312	4 36 36.6	9.310	18	2 42 22.64	2.0982	11 37 2.0	7.931
19	1 8 1.90	1.9335	4 45 54.8	9.297	19	2 44 28.67	2.1027	11 44 56.4	7.883
20	1 9 57.98	1.9359	4 55 12.3	9.284	20	2 46 34.97	2.1073	11 52 48.0	7.835
21	1 11 54.21	1.9384	5 4 28.9	9.270	21	2 48 41.55	2.1119	12 0 36.6	7.785
22	1 13 50.59	1.9408	5 13 44.7	9.256	22	2 50 48.40	2.1165	12 8 22.2	7.735
23	1 15 47.11	1.9433	N. 5 22 59.6	9.240	23	2 52 55.53	2.1212	N. 12 16 4.8	7.685
WEDNESDAY 6.					FRIDAY 8.				
0	1 17 43.79	1.9460	N. 5 32 13.5	9.224	0	2 55 2.94	2.1259	N. 12 23 44.4	7.633
1	1 19 40.63	1.9487	5 41 26.5	9.207	1	2 57 10.64	2.1307	12 31 20.8	7.580
2	1 21 37.63	1.9513	5 50 38.4	9.190	2	2 59 18.62	2.1353	12 38 54.0	7.526
3	1 23 34.79	1.9540	5 59 49.3	9.173	3	3 1 26.88	2.1402	12 46 23.9	7.471
4	1 25 32.11	1.9568	6 8 59.2	9.155	4	3 3 35.44	2.1450	12 53 50.5	7.416
5	1 27 29.61	1.9597	6 18 7.9	9.136	5	3 5 44.28	2.1498	13 1 13.8	7.359
6	1 29 27.28	1.9627	6 27 15.5	9.117	6	3 7 53.41	2.1547	13 8 33.6	7.302
7	1 31 25.13	1.9656	6 36 21.9	9.096	7	3 10 2.84	2.1596	13 15 50.0	7.244
8	1 33 23.15	1.9686	6 45 27.0	9.074	8	3 12 12.56	2.1644	13 23 2.9	7.185
9	1 35 21.36	1.9717	6 54 30.8	9.053	9	3 14 22.57	2.1693	13 30 12.2	7.124
10	1 37 19.75	1.9747	7 3 33.3	9.031	10	3 16 32.88	2.1743	13 37 17.8	7.062
11	1 39 18.32	1.9778	7 12 34.5	9.008	11	3 18 43.49	2.1793	13 44 19.7	7.001
12	1 41 17.09	1.9811	7 21 34.3	8.984	12	3 20 54.40	2.1843	13 51 17.9	6.938
13	1 43 16.05	1.9843	7 30 32.6	8.959	13	3 23 5.61	2.1893	13 58 12.3	6.875
14	1 45 15.21	1.9877	7 39 29.4	8.934	14	3 25 17.12	2.1943	14 5 2.9	6.810
15	1 47 14.57	1.9910	7 48 24.7	8.909	15	3 27 28.93	2.1994	14 11 49.5	6.744
16	1 49 14.13	1.9943	7 57 18.5	8.883	16	3 29 41.05	2.2045	14 18 32.2	6.677
17	1 51 13.89	1.9977	8 6 10.7	8.856	17	3 31 53.47	2.2096	14 25 10.8	6.609
18	1 53 13.86	2.0013	8 15 1.2	8.828	18	3 34 6.20	2.2147	14 31 45.3	6.541
19	1 55 14.05	2.0049	8 23 50.0	8.798	19	3 36 19.23	2.2197	14 38 15.7	6.472
20	1 57 14.45	2.0084	8 32 37.0	8.769	20	3 38 32.57	2.2248	14 44 41.9	6.402
21	1 59 15.06	2.0120	8 41 22.3	8.740	21	3 40 46.21	2.2299	14 51 3.9	6.330
22	2 1 15.89	2.0157	8 50 5.8	8.710	22	3 43 0.16	2.2351	14 57 21.5	6.257
23	2 3 16.95	2.0195	8 58 47.5	8.678	23	3 45 14.42	2.2402	15 3 34.7	6.183
24	2 5 18.23	2.0232	N. 9 7 27.2	8.646	24	3 47 28.99	2.2454	N. 15 9 43.5	6.109

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 9.					MONDAY 11.				
0	h m s	s	N. ° ' "	"	0	h m s	s	N. ° ' "	"
0	3 47 28.99	2.2454	N. 15 9 43.5	6.109	0	5 40 55.21	2.4685	N. 18 19 3.3	1.437
1	3 49 43.87	2.2506	15 15 47.8	6.033	1	5 43 23.43	2.4720	18 20 26.0	1.320
2	3 51 59.06	2.2557	15 21 47.5	5.957	2	5 45 51.85	2.4754	18 21 41.7	1.202
3	3 54 14.55	2.2607	15 27 42.6	5.880	3	5 48 20.48	2.4788	18 22 50.3	1.083
4	3 56 30.35	2.2659	15 33 33.1	5.802	4	5 50 49.31	2.4821	18 23 51.7	0.964
5	3 58 46.46	2.2711	15 39 18.8	5.722	5	5 53 18.33	2.4853	18 24 46.0	0.845
6	4 1 2.88	2.2762	15 44 59.7	5.642	6	5 55 47.55	2.4885	18 25 33.1	0.725
7	4 3 19.61	2.2814	15 50 35.8	5.561	7	5 58 16.95	2.4916	18 26 13.0	0.604
8	4 5 36.65	2.2865	15 56 7.0	5.478	8	6 0 46.54	2.4946	18 26 45.6	0.483
9	4 7 53.99	2.2916	16 1 33.2	5.395	9	6 3 16.30	2.4975	18 27 11.0	0.362
10	4 10 11.64	2.2967	16 6 54.4	5.311	10	6 5 46.24	2.5003	18 27 29.1	0.240
11	4 12 29.60	2.3017	16 12 10.5	5.226	11	6 8 16.34	2.5031	18 27 39.8	+0.117
12	4 14 47.85	2.3068	16 17 21.5	5.140	12	6 10 46.61	2.5057	18 27 43.2	-0.005
13	4 17 6.42	2.3120	16 22 27.3	5.052	13	6 13 17.03	2.5083	18 27 39.2	0.128
14	4 19 25.29	2.3170	16 27 27.8	4.964	14	6 15 47.61	2.5108	18 27 27.8	0.252
15	4 21 44.46	2.3220	16 32 23.0	4.876	15	6 18 18.33	2.5132	18 27 8.9	0.377
16	4 24 3.93	2.3271	16 37 12.9	4.786	16	6 20 49.20	2.5156	18 26 42.6	0.501
17	4 26 23.71	2.3321	16 41 57.3	4.694	17	6 23 20.20	2.5178	18 26 8.8	0.625
18	4 28 43.78	2.3370	16 46 36.2	4.602	18	6 25 51.34	2.5200	18 25 27.6	0.750
19	4 31 4.15	2.3420	16 51 9.5	4.509	19	6 28 22.60	2.5221	18 24 38.8	0.876
20	4 33 24.82	2.3469	16 55 37.3	4.416	20	6 30 53.99	2.5241	18 23 42.5	1.001
21	4 35 45.78	2.3518	16 59 59.4	4.321	21	6 33 25.49	2.5260	18 22 38.7	1.126
22	4 38 7.04	2.3567	17 4 15.8	4.225	22	6 35 57.11	2.5278	18 21 27.4	1.252
23	4 40 28.59	2.3615	N. 17 8 26.4	4.128	23	6 38 28.83	2.5295	N. 18 20 8.5	1.378
SUNDAY 10.					TUESDAY 12.				
0	h m s	s	N. ° ' "	"	0	h m s	s	N. ° ' "	"
0	4 42 50.42	2.3663	N. 17 12 31.2	4.031	0	6 41 0.65	2.5312	N. 18 18 42.0	1.504
1	4 45 12.55	2.3712	17 16 30.1	3.932	1	6 43 32.57	2.5327	18 17 8.0	1.630
2	4 47 34.96	2.3759	17 20 23.1	3.833	2	6 46 4.57	2.5341	18 15 26.4	1.757
3	4 49 57.66	2.3807	17 24 10.1	3.732	3	6 48 36.66	2.5354	18 13 37.2	1.882
4	4 52 20.64	2.3853	17 27 51.0	3.632	4	6 51 8.82	2.5367	18 11 40.5	2.008
5	4 54 43.90	2.3900	17 31 25.9	3.530	5	6 53 41.06	2.5379	18 9 36.2	2.135
6	4 57 7.44	2.3946	17 34 54.6	3.427	6	6 56 13.37	2.5390	18 7 24.3	2.261
7	4 59 31.25	2.3992	17 38 17.1	3.322	7	6 58 45.74	2.5399	18 5 4.9	2.387
8	5 1 55.34	2.4037	17 41 33.3	3.217	8	7 1 18.16	2.5408	18 2 37.9	2.513
9	5 4 19.70	2.4082	17 44 43.2	3.112	9	7 3 50.63	2.5416	18 0 3.3	2.640
10	5 6 44.32	2.4125	17 47 46.8	3.007	10	7 6 23.15	2.5423	17 57 21.1	2.766
11	5 9 9.20	2.4169	17 50 44.0	2.899	11	7 8 55.71	2.5429	17 54 31.4	2.892
12	5 11 34.35	2.4212	17 53 34.7	2.791	12	7 11 28.30	2.5434	17 51 34.1	3.017
13	5 13 59.75	2.4255	17 56 18.9	2.682	13	7 14 0.92	2.5439	17 48 29.3	3.142
14	5 16 25.41	2.4297	17 58 56.6	2.573	14	7 16 33.57	2.5444	17 45 17.0	3.267
15	5 18 51.32	2.4339	18 1 27.7	2.462	15	7 19 6.23	2.5444	17 41 57.2	3.392
16	5 21 17.48	2.4380	18 3 52.1	2.351	16	7 21 38.90	2.5446	17 38 30.0	3.517
17	5 23 43.88	2.4420	18 6 9.8	2.239	17	7 24 11.58	2.5447	17 34 55.2	3.642
18	5 26 10.52	2.4460	18 8 20.8	2.127	18	7 26 44.27	2.5447	17 31 13.0	3.765
19	5 28 37.40	2.4499	18 10 25.1	2.014	19	7 29 16.95	2.5446	17 27 23.4	3.888
20	5 31 4.51	2.4537	18 12 22.5	1.900	20	7 31 49.62	2.5443	17 23 26.4	4.012
21	5 33 31.85	2.4576	18 14 13.1	1.786	21	7 34 22.27	2.5441	17 19 22.0	4.134
22	5 35 59.42	2.4613	18 15 56.8	1.670	22	7 36 54.91	2.5438	17 15 10.3	4.257
23	5 38 27.21	2.4649	18 17 33.5	1.554	23	7 39 27.53	2.5433	17 10 51.2	4.379
24	5 40 55.21	2.4685	N. 18 19 3.3	1.437	24	7 42 0.11	2.5427	N. 17 6 24.8	4.501

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 13.					FRIDAY 15.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
1	7 42 0.11	2.5427	N. 17 6 24.8	4.501	1	9 42 6.11	2.4411	N. 11 25 5.6	9.335
2	7 44 32.66	2.5422	17 1 51.1	4.622	2	9 44 32.48	2.4380	11 15 43.3	9.408
3	7 47 5.17	2.5414	16 57 10.2	4.742	3	9 46 58.67	2.4349	11 6 16.6	9.481
4	7 49 37.63	2.5407	16 52 22.1	4.862	4	9 49 24.67	2.4317	10 56 45.6	9.551
5	7 52 10.05	2.5398	16 47 26.8	4.981	5	9 51 50.48	2.4287	10 47 10.5	9.620
6	7 54 42.41	2.5388	16 42 24.4	5.100	6	9 54 16.11	2.4255	10 37 31.2	9.688
7	7 57 14.71	2.5378	16 37 14.8	5.218	7	9 56 41.54	2.4223	10 27 47.9	9.754
8	7 59 46.95	2.5367	16 31 58.2	5.335	8	9 59 6.79	2.4192	10 18 0.7	9.819
9	8 2 19.12	2.5355	16 26 34.6	5.452	9	10 1 31.85	2.4160	10 8 9.6	9.883
10	8 4 51.21	2.5342	16 21 4.0	5.567	10	10 3 56.71	2.4128	9 58 14.7	9.946
11	8 7 23.23	2.5329	16 15 26.5	5.682	11	10 6 21.39	2.4097	9 48 16.1	10.007
12	8 9 55.16	2.5315	16 9 42.1	5.797	12	10 8 45.88	2.4065	9 38 13.9	10.067
13	8 12 27.01	2.5301	16 3 50.9	5.911	13	10 11 10.17	2.4033	9 28 8.1	10.125
14	8 14 58.77	2.5285	15 57 52.8	6.024	14	10 13 34.28	2.4002	9 17 58.9	10.182
15	8 17 30.43	2.5268	15 51 48.0	6.136	15	10 15 58.19	2.3970	9 7 46.3	10.238
16	8 20 1.99	2.5252	15 45 36.5	6.247	16	10 18 21.92	2.3939	8 57 30.4	10.292
17	8 22 33.45	2.5234	15 39 18.3	6.358	17	10 20 45.46	2.3907	8 47 11.3	10.344
18	8 25 4.80	2.5216	15 32 53.5	6.467	18	10 23 8.80	2.3875	8 36 49.1	10.396
19	8 27 36.04	2.5197	15 26 22.2	6.576	19	10 25 31.96	2.3844	8 26 23.8	10.447
20	8 30 7.17	2.5178	15 19 44.4	6.684	20	10 27 54.93	2.3813	8 15 55.5	10.495
21	8 32 38.18	2.5157	15 13 0.1	6.791	21	10 30 17.72	2.3782	8 5 24.4	10.542
22	8 35 9.06	2.5137	15 6 9.5	6.896	22	10 32 40.32	2.3751	7 54 50.5	10.588
23	8 37 39.82	2.5116	14 59 12.6	7.001	23	10 35 2.73	2.3720	7 44 13.8	10.633
24	8 40 10.45	2.5094	N. 14 52 9.4	7.105	24	10 37 24.96	2.3689	N. 7 33 34.5	10.676
THURSDAY 14.					SATURDAY 16.				
0	8 42 40.95	2.5072	N. 14 45 0.0	7.208	0	10 39 47.00	2.3658	N. 7 22 52.7	10.717
1	8 45 11.31	2.5049	14 37 44.4	7.310	1	10 42 8.86	2.3627	7 12 8.4	10.758
2	8 47 41.54	2.5026	14 30 22.8	7.411	2	10 44 30.53	2.3597	7 1 21.7	10.797
3	8 50 11.62	2.5002	14 22 55.1	7.511	3	10 46 52.02	2.3567	6 50 32.7	10.835
4	8 52 41.56	2.4977	14 15 21.5	7.609	4	10 49 13.34	2.3537	6 39 41.5	10.872
5	8 55 11.34	2.4952	14 7 42.0	7.707	5	10 51 34.47	2.3507	6 28 48.1	10.907
6	8 57 40.98	2.4927	13 59 56.7	7.803	6	10 53 55.43	2.3478	6 17 52.7	10.941
7	9 0 10.47	2.4902	13 52 5.6	7.898	7	10 56 16.21	2.3448	6 6 55.2	10.973
8	9 2 39.80	2.4875	13 44 8.9	7.992	8	10 58 36.81	2.3419	5 55 55.9	11.003
9	9 5 8.97	2.4848	13 36 6.5	8.086	9	11 0 57.24	2.3391	5 44 54.8	11.033
10	9 7 37.98	2.4821	13 27 58.6	8.177	10	11 3 17.50	2.3362	5 33 51.9	11.062
11	9 10 6.82	2.4793	13 19 45.2	8.268	11	11 5 37.58	2.3333	5 22 47.3	11.089
12	9 12 35.50	2.4766	13 11 26.4	8.358	12	11 7 57.50	2.3306	5 11 41.2	11.114
13	9 15 4.01	2.4738	13 3 2.2	8.447	13	11 10 17.25	2.3277	5 0 33.6	11.138
14	9 17 32.36	2.4710	12 54 32.8	8.533	14	11 12 36.83	2.3249	4 49 24.6	11.162
15	9 20 0.53	2.4681	12 45 58.2	8.619	15	11 14 56.24	2.3222	4 38 14.2	11.184
16	9 22 28.53	2.4652	12 37 18.5	8.704	16	11 17 15.50	2.3196	4 27 2.5	11.204
17	9 24 56.36	2.4623	12 28 33.7	8.787	17	11 19 34.59	2.3168	4 15 49.7	11.222
18	9 27 24.01	2.4593	12 19 44.0	8.869	18	11 21 53.52	2.3142	4 4 35.8	11.240
19	9 29 51.48	2.4563	12 10 49.4	8.950	19	11 24 12.29	2.3116	3 53 20.9	11.257
20	9 32 18.77	2.4533	12 1 50.0	9.030	20	11 26 30.91	2.3091	3 42 5.0	11.272
21	9 34 45.88	2.4503	11 52 45.8	9.109	21	11 28 49.38	2.3065	3 30 48.2	11.287
22	9 37 12.81	2.4472	11 43 36.9	9.186	22	11 31 7.69	2.3039	3 19 30.6	11.299
23	9 39 39.55	2.4442	11 34 23.5	9.261	23	11 33 25.85	2.3014	3 8 12.3	11.310
24	9 42 6.11	2.4411	N. 11 25 5.6	9.335	24	11 35 43.86	2.2990	N. 2 56 53.4	11.320

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 17.					TUESDAY 19.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	11 35 43.86	2.2990	N. 2 56 53.4	11.320	0	13 23 57.89	2.2253	S. 5 55 36.6	10.448
1	11 38 1.73	2.2966	2 45 33.9	11.329	1	13 26 11.39	2.2247	6 6 2.2	10.405
2	11 40 19.45	2.2942	2 34 13.9	11.337	2	13 28 24.86	2.2242	6 16 25.2	10.361
3	11 42 37.04	2.2919	2 22 53.5	11.342	3	13 30 38.29	2.2236	6 26 45.5	10.315
4	11 44 54.48	2.2896	2 11 32.8	11.347	4	13 32 51.69	2.2231	6 37 3.0	10.269
5	11 47 11.79	2.2873	2 0 11.8	11.352	5	13 35 5.06	2.2226	6 47 17.8	10.222
6	11 49 28.96	2.2850	1 48 50.6	11.354	6	13 37 18.40	2.2221	6 57 29.7	10.174
7	11 51 45.99	2.2828	1 37 29.3	11.355	7	13 39 31.71	2.2217	7 7 38.7	10.126
8	11 54 2.90	2.2807	1 26 8.0	11.355	8	13 41 45.00	2.2213	7 17 44.8	10.077
9	11 56 19.68	2.2786	1 14 46.7	11.354	9	13 43 58.27	2.2209	7 27 47.9	10.026
10	11 58 36.33	2.2764	1 3 25.5	11.352	10	13 46 11.51	2.2206	7 37 47.9	9.974
11	12 0 52.85	2.2744	0 52 4.4	11.349	11	13 48 24.74	2.2203	7 47 44.8	9.922
12	12 3 9.26	2.2724	0 40 43.6	11.344	12	13 50 37.95	2.2201	7 57 38.6	9.870
13	12 5 25.54	2.2704	0 29 23.1	11.338	13	13 52 51.15	2.2198	8 7 29.2	9.816
14	12 7 41.71	2.2685	0 18 3.0	11.331	14	13 55 4.33	2.2196	8 17 16.5	9.762
15	12 9 57.76	2.2666	N. 0 6 43.4	11.323	15	13 57 17.50	2.2194	8 27 0.6	9.707
16	12 12 13.70	2.2647	S. 0 4 35.8	11.314	16	13 59 30.66	2.2192	8 36 41.3	9.650
17	12 14 29.53	2.2629	0 15 54.3	11.303	17	14 1 43.81	2.2191	8 46 18.6	9.593
18	12 16 45.25	2.2611	0 27 12.2	11.292	18	14 3 56.95	2.2190	8 55 52.5	9.536
19	12 19 0.86	2.2593	0 38 29.3	11.278	19	14 6 10.09	2.2190	9 5 22.9	9.477
20	12 21 16.37	2.2576	0 49 45.6	11.265	20	14 8 23.23	2.2189	9 14 49.7	9.417
21	12 23 31.77	2.2559	1 1 1.1	11.251	21	14 10 36.36	2.2188	9 24 13.0	9.358
22	12 25 47.08	2.2543	1 12 15.7	11.234	22	14 12 49.49	2.2188	9 33 32.7	9.297
23	12 28 2.29	2.2527	S. 1 23 29.2	11.217	23	14 15 2.62	2.2188	S. 9 42 48.7	9.235
MONDAY 18.					WEDNESDAY 20.				
0	12 30 17.40	2.2511	S. 1 34 41.7	11.198	0	14 17 15.75	2.2188	S. 9 52 0.9	9.172
1	12 32 32.42	2.2496	1 45 53.0	11.178	1	14 19 28.88	2.2189	10 1 9.4	9.110
2	12 34 47.35	2.2482	1 57 3.1	11.158	2	14 21 42.02	2.2190	10 10 14.1	9.046
3	12 37 2.20	2.2467	2 8 12.0	11.137	3	14 23 55.16	2.2191	10 19 14.9	8.982
4	12 39 16.96	2.2453	2 19 19.5	11.113	4	14 26 8.31	2.2192	10 28 11.9	8.917
5	12 41 31.64	2.2440	2 30 25.6	11.090	5	14 28 21.47	2.2193	10 37 4.9	8.851
6	12 43 46.24	2.2427	2 41 30.3	11.066	6	14 30 34.63	2.2195	10 45 54.0	8.784
7	12 46 0.76	2.2414	2 52 33.5	11.040	7	14 32 47.81	2.2197	10 54 39.0	8.717
8	12 48 15.21	2.2402	3 3 35.1	11.013	8	14 35 0.99	2.2198	11 3 20.0	8.649
9	12 50 29.58	2.2389	3 14 35.1	10.985	9	14 37 14.19	2.2201	11 11 56.9	8.580
10	12 52 43.88	2.2378	3 25 33.3	10.956	10	14 39 27.40	2.2202	11 20 29.6	8.510
11	12 54 58.11	2.2367	3 36 29.8	10.927	11	14 41 40.62	2.2205	11 28 58.1	8.440
12	12 57 12.28	2.2356	3 47 24.5	10.896	12	14 43 53.86	2.2207	11 37 22.4	8.369
13	12 59 26.38	2.2345	3 58 17.3	10.863	13	14 46 7.11	2.2210	11 45 42.4	8.298
14	13 1 40.42	2.2335	4 9 8.1	10.830	14	14 48 20.38	2.2213	11 53 58.2	8.227
15	13 3 54.40	2.2325	4 19 56.9	10.797	15	14 50 33.67	2.2217	12 2 9.6	8.153
16	13 6 8.32	2.2316	4 30 43.7	10.762	16	14 52 46.98	2.2219	12 10 16.6	8.080
17	13 8 22.19	2.2307	4 41 28.3	10.726	17	14 55 0.30	2.2222	12 18 19.2	8.007
18	13 10 36.00	2.2298	4 52 10.8	10.689	18	14 57 13.64	2.2225	12 26 17.4	7.932
19	13 12 49.76	2.2290	5 2 51.0	10.651	19	14 59 27.00	2.2228	12 34 11.1	7.857
20	13 15 3.48	2.2282	5 13 28.9	10.612	20	15 1 40.38	2.2232	12 42 0.3	7.782
21	13 17 17.15	2.2274	5 24 4.5	10.573	21	15 3 53.79	2.2236	12 49 44.9	7.705
22	13 19 30.77	2.2267	5 34 37.7	10.532	22	15 6 7.21	2.2238	12 57 24.9	7.628
23	13 21 44.35	2.2260	5 45 8.4	10.490	23	15 8 20.65	2.2242	13 5 0.3	7.551
24	13 23 57.89	2.2253	S. 5 55 36.6	10.448	24	15 10 34.11	2.2245	S. 13 12 31.0	7.472



## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 21.					SATURDAY 23.				
0	15 10 34.11	2.2245	S. 13 12 31.0	7.472	0	16 57 40.43	2.2329	S. 17 32 20.0	3.212
1	15 12 47.59	2.2249	13 19 57.0	7.394	1	16 59 54.40	2.2326	17 35 29.9	3.117
2	15 15 1.10	2.2253	13 27 18.3	7.315	2	17 2 8.34	2.2323	17 38 34.0	3.020
3	15 17 14.63	2.2257	13 34 34.8	7.235	3	17 4 22.27	2.2320	17 41 32.3	2.924
4	15 19 28.18	2.2260	13 41 46.5	7.155	4	17 6 36.18	2.2316	17 44 24.9	2.828
5	15 21 41.75	2.2264	13 48 53.4	7.074	5	17 8 50.06	2.2312	17 47 11.7	2.732
6	15 23 55.35	2.2268	13 55 55.4	6.992	6	17 11 3.92	2.2307	17 49 52.7	2.635
7	15 26 8.97	2.2272	14 2 52.5	6.911	7	17 13 17.75	2.2302	17 52 27.9	2.538
8	15 28 22.61	2.2275	14 9 44.7	6.828	8	17 15 31.55	2.2297	17 54 57.3	2.442
9	15 30 36.27	2.2278	14 16 31.9	6.746	9	17 17 45.32	2.2292	17 57 21.0	2.346
10	15 32 49.95	2.2282	14 23 14.2	6.662	10	17 19 59.05	2.2286	17 59 38.8	2.248
11	15 35 3.66	2.2287	14 29 51.4	6.577	11	17 22 12.75	2.2280	18 1 50.8	2.152
12	15 37 17.39	2.2290	14 36 23.5	6.493	12	17 24 26.41	2.2274	18 3 57.0	2.055
13	15 39 31.14	2.2293	14 42 50.6	6.409	13	17 26 40.04	2.2267	18 5 57.4	1.958
14	15 41 44.91	2.2297	14 49 12.6	6.324	14	17 28 53.62	2.2260	18 7 52.0	1.861
15	15 43 58.70	2.2301	14 55 29.5	6.238	15	17 31 7.16	2.2252	18 9 40.7	1.764
16	15 46 12.52	2.2304	15 1 41.2	6.152	16	17 33 20.65	2.2245	18 11 23.7	1.667
17	15 48 26.35	2.2307	15 7 47.8	6.066	17	17 35 34.10	2.2237	18 13 0.8	1.570
18	15 50 40.20	2.2310	15 13 49.1	5.978	18	17 37 47.50	2.2229	18 14 32.1	1.473
19	15 52 54.07	2.2313	15 19 45.2	5.891	19	17 40 0.85	2.2220	18 15 57.6	1.377
20	15 55 7.96	2.2316	15 25 36.0	5.803	20	17 42 14.14	2.2211	18 17 17.3	1.280
21	15 57 21.86	2.2318	15 31 21.6	5.716	21	17 44 27.38	2.2202	18 18 31.2	1.183
22	15 59 35.78	2.2322	15 37 1.9	5.627	22	17 46 40.56	2.2192	18 19 39.3	1.087
23	16 1 49.72	2.2324	S. 15 42 36.8	5.537	23	17 48 53.68	2.2182	S. 18 20 41.6	0.990
FRIDAY 22.					SUNDAY 24.				
0	16 4 3.67	2.2327	S. 15 48 6.3	5.447	0	17 51 6.74	2.2172	S. 18 21 38.1	0.893
1	16 6 17.64	2.2329	15 53 30.5	5.358	1	17 53 19.74	2.2161	18 22 28.8	0.797
2	16 8 31.62	2.2332	15 58 49.3	5.268	2	17 55 32.67	2.2150	18 23 13.7	0.701
3	16 10 45.62	2.2334	16 4 2.7	5.177	3	17 57 45.54	2.2138	18 23 52.9	0.605
4	16 12 59.63	2.2335	16 9 10.6	5.087	4	17 59 58.33	2.2126	18 24 26.3	0.508
5	16 15 13.64	2.2337	16 14 13.1	4.996	5	18 2 11.05	2.2114	18 24 53.9	0.412
6	16 17 27.67	2.2339	16 19 10.1	4.905	6	18 4 23.70	2.2102	18 25 15.8	0.317
7	16 19 41.71	2.2340	16 24 1.7	4.813	7	18 6 36.27	2.2088	18 25 31.9	0.221
8	16 21 55.75	2.2341	16 28 47.7	4.720	8	18 8 48.76	2.2076	18 25 42.3	0.126
9	16 24 9.80	2.2342	16 33 28.1	4.627	9	18 11 1.18	2.2062	18 25 47.0	-0.030
10	16 26 23.86	2.2343	16 38 3.0	4.536	10	18 13 13.51	2.2047	18 25 45.9	+0.066
11	16 28 37.92	2.2343	16 42 32.4	4.442	11	18 15 25.75	2.2033	18 25 39.1	0.161
12	16 30 51.98	2.2344	16 46 56.1	4.348	12	18 17 37.91	2.2019	18 25 26.6	0.256
13	16 33 6.05	2.2344	16 51 14.2	4.255	13	18 19 49.98	2.2004	18 25 8.4	0.350
14	16 35 20.11	2.2343	16 55 26.7	4.162	14	18 22 1.96	2.1989	18 24 44.6	0.444
15	16 37 34.17	2.2343	16 59 33.6	4.068	15	18 24 13.85	2.1973	18 24 15.1	0.538
16	16 39 48.23	2.2343	17 3 34.9	3.974	16	18 26 25.64	2.1957	18 23 40.0	0.632
17	16 42 2.29	2.2342	17 7 30.5	3.879	17	18 28 37.34	2.1942	18 22 59.2	0.727
18	16 44 16.34	2.2341	17 11 20.4	3.784	18	18 30 48.94	2.1925	18 22 12.8	0.819
19	16 46 30.38	2.2339	17 15 4.6	3.689	19	18 33 0.44	2.1907	18 21 20.9	0.912
20	16 48 44.41	2.2338	17 18 43.1	3.594	20	18 35 11.83	2.1890	18 20 23.4	1.005
21	16 50 58.44	2.2337	17 22 15.9	3.499	21	18 37 23.12	2.1873	18 19 20.3	1.098
22	16 53 12.45	2.2334	17 25 43.0	3.404	22	18 39 34.31	2.1855	18 18 11.6	1.191
23	16 55 26.45	2.2332	17 29 4.4	3.308	23	18 41 45.38	2.1836	18 16 57.4	1.282
24	16 57 40.43	2.2329	S. 17 32 20.0	3.212	24	18 43 56.34	2.1817	S. 18 15 37.7	1.374

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 25.					WEDNESDAY 27.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	18 43 56.34	2.1817	S. 18 15 37.7	1.374	0	20 26 2.94	2.0657	S. 15 31 29.8	5.284
1	18 46 7.19	2.1799	18 14 12.5	1.466	1	20 28 6.80	2.0629	15 26 10.7	5.353
2	18 48 17.93	2.1780	18 12 41.8	1.557	2	20 30 10.49	2.0602	15 20 47.4	5.422
3	18 50 28.55	2.1760	18 11 5.7	1.647	3	20 32 14.02	2.0574	15 15 20.1	5.488
4	18 52 39.05	2.1741	18 9 24.1	1.737	4	20 34 17.38	2.0547	15 9 48.8	5.556
5	18 54 49.44	2.1721	18 7 37.2	1.827	5	20 36 20.58	2.0520	15 4 13.4	5.623
6	18 56 59.70	2.1700	18 5 44.8	1.918	6	20 38 23.62	2.0492	14 58 34.0	5.689
7	18 59 9.84	2.1680	18 3 47.0	2.007	7	20 40 26.49	2.0464	14 52 50.7	5.754
8	19 1 19.86	2.1659	18 1 43.9	2.096	8	20 42 29.19	2.0437	14 47 3.5	5.819
9	19 3 29.75	2.1638	17 59 35.5	2.184	9	20 44 31.73	2.0410	14 41 12.4	5.883
10	19 5 39.51	2.1617	17 57 21.8	2.272	10	20 46 34.11	2.0382	14 35 17.5	5.947
11	19 7 49.15	2.1595	17 55 2.8	2.360	11	20 48 36.32	2.0355	14 29 18.8	6.009
12	19 9 58.65	2.1573	17 52 38.6	2.447	12	20 50 38.37	2.0328	14 23 16.4	6.072
13	19 12 8.02	2.1551	17 50 9.1	2.535	13	20 52 40.26	2.0301	14 17 10.2	6.134
14	19 14 17.26	2.1528	17 47 34.4	2.622	14	20 54 41.98	2.0273	14 11 0.3	6.195
15	19 16 26.36	2.1506	17 44 54.4	2.709	15	20 56 43.54	2.0247	14 4 46.8	6.255
16	19 18 35.33	2.1483	17 42 9.3	2.794	16	20 58 44.94	2.0219	13 58 29.7	6.315
17	19 20 44.16	2.1460	17 39 19.1	2.879	17	21 0 46.17	2.0192	13 52 9.0	6.375
18	19 22 52.85	2.1436	17 36 23.8	2.964	18	21 2 47.24	2.0166	13 45 44.7	6.434
19	19 25 1.39	2.1413	17 33 23.4	3.049	19	21 4 48.16	2.0139	13 39 16.9	6.492
20	19 27 9.80	2.1389	17 30 17.9	3.133	20	21 6 48.91	2.0112	13 32 45.6	6.550
21	19 29 18.06	2.1364	17 27 7.4	3.217	21	21 8 49.50	2.0085	13 26 10.9	6.607
22	19 31 26.17	2.1340	17 23 51.9	3.300	22	21 10 49.93	2.0058	13 19 32.8	6.662
23	19 33 34.14	2.1315	S. 17 20 31.4	3.382	23	21 12 50.20	2.0032	S. 13 12 51.4	6.718
TUESDAY 26.					THURSDAY 28.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	19 35 41.95	2.1290	S. 17 17 6.0	3.464	0	21 14 50.31	2.0006	S. 13 6 6.6	6.774
1	19 37 49.62	2.1266	17 13 35.7	3.546	1	21 16 50.27	1.9980	12 59 18.5	6.828
2	19 39 57.14	2.1241	17 10 0.4	3.628	2	21 18 50.07	1.9953	12 52 27.2	6.882
3	19 42 4.51	2.1216	17 6 20.3	3.708	3	21 20 49.71	1.9927	12 45 32.6	6.937
4	19 44 11.73	2.1190	17 2 35.4	3.789	4	21 22 49.20	1.9902	12 38 34.8	6.989
5	19 46 18.79	2.1164	16 58 45.6	3.869	5	21 24 48.54	1.9877	12 31 33.9	7.041
6	19 48 25.70	2.1139	16 54 51.1	3.948	6	21 26 47.72	1.9852	12 24 29.9	7.092
7	19 50 32.46	2.1113	16 50 51.9	4.027	7	21 28 46.76	1.9827	12 17 22.8	7.143
8	19 52 39.06	2.1087	16 46 47.9	4.105	8	21 30 45.64	1.9801	12 10 12.7	7.193
9	19 54 45.50	2.1061	16 42 39.3	4.182	9	21 32 44.37	1.9776	12 2 59.6	7.243
10	19 56 51.79	2.1035	16 38 26.0	4.260	10	21 34 42.95	1.9752	11 55 43.5	7.292
11	19 58 57.92	2.1008	16 34 8.1	4.337	11	21 36 41.39	1.9727	11 48 24.5	7.341
12	20 1 3.89	2.0982	16 29 45.6	4.412	12	21 38 39.68	1.9702	11 41 2.6	7.388
13	20 3 9.70	2.0955	16 25 18.6	4.488	13	21 40 37.82	1.9678	11 33 37.9	7.436
14	20 5 15.35	2.0928	16 20 47.0	4.564	14	21 42 35.82	1.9653	11 26 10.3	7.483
15	20 7 20.84	2.0902	16 16 10.9	4.638	15	21 44 33.68	1.9631	11 18 40.0	7.528
16	20 9 26.17	2.0874	16 11 30.4	4.712	16	21 46 31.39	1.9607	11 11 6.9	7.574
17	20 11 31.33	2.0847	16 6 45.4	4.786	17	21 48 28.96	1.9583	11 3 31.1	7.618
18	20 13 36.34	2.0821	16 1 56.1	4.858	18	21 50 26.39	1.9561	10 55 52.7	7.663
19	20 15 41.18	2.0793	15 57 2.4	4.931	19	21 52 23.69	1.9538	10 48 11.6	7.707
20	20 17 45.86	2.0766	15 52 4.4	5.002	20	21 54 20.85	1.9516	10 40 27.9	7.750
21	20 19 50.37	2.0738	15 47 2.1	5.074	21	21 56 17.88	1.9493	10 32 41.6	7.793
22	20 21 54.72	2.0712	15 41 55.5	5.144	22	21 58 14.77	1.9471	10 24 52.8	7.833
23	20 23 58.91	2.0685	15 36 44.8	5.214	23	22 0 11.53	1.9449	10 17 1.6	7.875
24	20 26 2.94	2.0657	S. 15 31 29.8	5.284	24	22 2 8.16	1.9427	S. 10 9 7.8	7.917

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 29.					SUNDAY 31.				
0	22 2 8.16	1.9427	S. 10 9 7.8	7.917	0	23 33 28.56	1.8765	S. 3 13 26.0	9.187
1	22 4 4.66	1.9406	10 1 11.6	7.956	1	23 35 21.14	1.8761	3 4 14.4	9.200
2	22 6 1.03	1.9385	9 53 13.1	7.995	2	23 37 13.69	1.8757	2 55 2.0	9.213
3	22 7 57.28	1.9364	9 45 12.2	8.034	3	23 39 6.22	1.8752	2 45 48.8	9.225
4	22 9 53.40	1.9343	9 37 9.0	8.072	4	23 40 58.72	1.8749	2 36 35.0	9.235
5	22 11 49.40	1.9323	9 29 3.5	8.110	5	23 42 51.21	1.8747	2 27 20.6	9.246
6	22 13 45.28	1.9303	9 20 55.8	8.147	6	23 44 43.68	1.8744	2 18 5.5	9.257
7	22 15 41.04	1.9283	9 12 45.9	8.183	7	23 46 36.14	1.8742	2 8 49.8	9.266
8	22 17 36.68	1.9264	9 4 33.8	8.220	8	23 48 28.59	1.8741	1 59 33.6	9.275
9	22 19 32.21	1.9245	8 56 19.5	8.255	9	23 50 21.03	1.8740	1 50 16.8	9.284
10	22 21 27.62	1.9226	8 48 3.2	8.289	10	23 52 13.47	1.8739	1 40 59.5	9.292
11	22 23 22.92	1.9207	8 39 44.8	8.323	11	23 54 5.90	1.8738	1 31 41.8	9.299
12	22 25 18.11	1.9189	8 31 24.4	8.357	12	23 55 58.33	1.8739	1 22 23.6	9.307
13	22 27 13.19	1.9172	8 23 2.0	8.390	13	23 57 50.77	1.8740	1 13 5.0	9.313
14	22 29 8.17	1.9154	8 14 37.6	8.422	14	23 59 43.21	1.8740	1 3 46.1	9.318
15	22 31 3.04	1.9136	8 6 11.3	8.454	15	0 1 35.65	1.8742	0 54 26.8	9.324
16	22 32 57.80	1.9119	7 57 43.1	8.486	16	0 3 28.11	1.8744	0 45 7.2	9.329
17	22 34 52.47	1.9103	7 49 13.0	8.517	17	0 5 20.58	1.8747	0 35 47.3	9.333
18	22 36 47.04	1.9087	7 40 41.1	8.547	18	0 7 13.07	1.8750	0 26 27.2	9.337
19	22 38 41.51	1.9070	7 32 7.4	8.576	19	0 9 5.58	1.8753	0 17 6.9	9.340
20	22 40 35.88	1.9054	7 23 32.0	8.604	20	0 10 58.11	1.8757	S. 0 7 46.4	9.343
21	22 42 30.16	1.9039	7 14 54.9	8.633	21	0 12 50.66	1.8761	N. 0 1 34.3	9.345
22	22 44 24.35	1.9024	7 6 16.1	8.661	22	0 14 43.24	1.8766	0 10 55.0	9.347
23	22 46 18.45	1.9010	S. 6 57 35.6	8.687	23	0 16 35.85	1.8771	N. 0 20 15.9	9.348
SATURDAY 30.					MONDAY, AUGUST 1.				
0	22 48 12.47	1.8996	S. 6 48 53.6	8.714	0	0 18 28.49	1.8777	N. 0 29 36.8	9.348
1	22 50 6.40	1.8982	6 40 9.9	8.741	PHASES OF THE MOON.				
2	22 52 0.25	1.8967	6 31 24.7	8.766					
3	22 53 54.01	1.8954	6 22 38.0	8.791					
4	22 55 47.70	1.8942	6 13 49.8	8.816					
5	22 57 41.31	1.8929	6 5 0.1	8.840					
6	22 59 34.85	1.8917	5 56 9.0	8.862					
7	23 1 28.32	1.8906	5 47 16.6	8.885					
8	23 3 21.72	1.8894	5 38 22.8	8.907					
9	23 5 15.05	1.8883	5 29 27.7	8.929					
10	23 7 8.32	1.8873	5 20 31.3	8.950					
11	23 9 1.53	1.8862	5 11 33.7	8.970					
12	23 10 54.67	1.8852	5 2 34.9	8.990					
13	23 12 47.76	1.8843	4 53 34.9	9.010					
14	23 14 40.79	1.8833	4 44 33.7	9.029					
15	23 16 33.76	1.8825	4 35 31.4	9.047					
16	23 18 26.69	1.8817	4 26 28.0	9.065					
17	23 20 19.57	1.8809	4 17 23.6	9.082					
18	23 22 12.40	1.8802	4 8 18.1	9.099					
19	23 24 5.19	1.8795	3 59 11.7	9.115					
20	23 25 57.94	1.8788	3 50 4.3	9.131					
21	23 27 50.65	1.8782	3 40 56.0	9.146					
22	23 29 43.32	1.8776	3 31 46.8	9.160					
23	23 31 35.96	1.8770	3 22 36.8	9.173					
24	23 33 28.56	1.8765	S. 3 13 26.0	9.187					

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
1	Antares W.	72 27 25	3090	73 55 47	3094	75 24 4	3098	76 52 16	3102
	JUPITER E.	65 55 36	3078	64 26 59	3083	62 58 29	3088	61 30 5	3093
	α Arietis E.	75 30 1	3156	74 2 59	3163	72 36 5	3171	71 9 21	3178
	Aldebaran E.	108 0 15	3023	106 30 31	3029	105 0 55	3034	103 31 25	3040
2	Antares W.	84 12 8	3119	85 39 55	3122	87 7 38	3124	88 35 18	3126
	α Aquilæ W.	41 11 9	4216	42 19 20	4155	43 28 29	4099	44 38 32	4047
	JUPITER E.	54 9 30	3113	52 41 36	3116	51 13 46	3118	49 45 58	3120
	α Arietis E.	63 57 47	3213	62 31 54	3220	61 6 9	3227	59 40 32	3235
	Aldebaran E.	96 5 18	3059	94 36 18	3062	93 7 22	3061	91 38 28	3066
	SUN E.	127 37 51	3448	126 16 29	3450	124 55 9	3451	123 33 50	3453
3	Antares W.	95 53 13	3131	97 20 45	3131	98 48 17	3130	100 15 50	3130
	α Aquilæ W.	50 40 10	3847	51 54 24	3816	53 9 10	3786	54 24 27	3759
	SATURN W.	24 10 17	3103	25 38 23	3097	27 6 36	3091	28 34 56	3087
	JUPITER E.	42 27 31	3125	40 59 52	3124	39 32 12	3124	38 4 32	3123
	α Arietis E.	52 34 37	3271	51 9 52	3280	49 45 17	3289	48 20 53	3298
	Aldebaran E.	84 14 27	3070	82 45 41	3070	81 16 55	3069	79 48 7	3068
	SUN E.	116 47 36	3454	115 26 21	3454	114 5 6	3452	112 43 49	3450
4	Antares W.	107 33 52	3121	109 1 36	3118	110 29 23	3115	111 57 14	3112
	α Aquilæ W.	60 47 30	3643	62 5 18	3623	63 23 28	3603	64 41 59	3585
	SATURN W.	35 58 5	3062	37 27 1	3056	38 56 5	3049	40 25 17	3043
	JUPITER E.	30 45 43	3112	29 17 48	3109	27 49 49	3105	26 21 45	3101
	α Arietis E.	41 21 45	3356	39 58 38	3371	38 35 48	3388	37 13 17	3408
	Aldebaran E.	72 23 34	3055	70 54 29	3051	69 25 19	3046	67 56 4	3041
	SUN E.	105 56 42	3435	104 35 5	3430	103 13 23	3425	101 51 35	3420
5	α Aquilæ W.	71 19 23	3501	72 39 46	3485	74 0 27	3469	75 21 26	3454
	SATURN W.	47 53 18	3007	49 23 22	2998	50 53 36	2989	52 24 2	2981
	Aldebaran E.	60 28 2	3009	58 58 1	3002	57 27 52	2994	55 57 32	2985
	SUN E.	95 0 51	3385	93 38 17	3376	92 15 34	3367	90 52 40	3358
6	α Aquilæ W.	82 10 27	3382	83 33 4	3369	84 55 56	3354	86 19 5	3341
	SATURN W.	59 59 12	2929	61 30 54	2917	63 2 51	2905	64 35 3	2893
	Aldebaran E.	48 22 57	2935	46 51 24	2924	45 19 36	2913	43 47 34	2901
	SUN E.	83 55 19	3304	82 31 12	3292	81 6 51	3279	79 42 15	3266
7	α Aquilæ W.	93 18 37	3276	94 43 16	3264	96 8 10	3253	97 33 17	3241
	SATURN W.	72 20 10	2826	73 54 4	2812	75 28 16	2797	77 2 48	2782
	α Pegasi W.	45 35 24	3351	46 58 36	3313	48 22 33	3275	49 47 14	3239
	Aldebaran E.	36 3 22	2835	34 29 40	2821	32 55 40	2807	31 21 21	2792
	SUN E.	72 35 22	3196	71 9 8	3181	69 42 36	3165	68 15 45	3149
8	α Aquilæ W.	104 42 9	3190	106 8 30	3181	107 35 2	3173	109 1 43	3166
	SATURN W.	85 0 28	2704	86 37 3	2687	88 14 0	2671	89 51 19	2654
	α Pegasi W.	57 0 49	3078	58 29 25	3050	59 58 36	3022	61 28 22	2995
	JUPITER W.	17 49 34	2775	19 24 35	2756	21 0 0	2737	22 35 50	2718
	SUN E.	60 56 39	3067	59 27 49	3049	57 58 37	3032	56 29 4	3014
9	SATURN W.	98 3 39	2568	99 43 18	2552	101 23 19	2535	103 3 44	2517
	α Pegasi W.	69 5 23	2869	70 38 21	2847	72 11 48	2824	73 45 45	2801

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV <sup>h</sup>	P. L. of Diff.	XVIII <sup>h</sup>	P. L. of Diff.	XXI <sup>h</sup>	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
1	Antares	W.	78 20 23	3106	79 48 25	3110	81 16 23	3113	82 44 17	3116
	JUPITER	E.	60 1 48	3098	58 33 36	3103	57 5 30	3106	55 37 28	3110
	α Arietis	E.	69 42 45	3185	68 16 18	3192	66 49 59	3199	65 23 49	3206
	Aldebaran	E.	102 2 2	3044	100 32 44	3048	99 3 31	3052	97 34 22	3056
2	Antares	W.	90 2 56	3128	91 30 32	3129	92 58 7	3130	94 25 40	3131
	α Aquilæ	W.	45 49 26	4000	47 1 6	3957	48 13 28	3918	49 26 30	3880
	JUPITER	E.	48 18 13	3122	46 50 30	3124	45 22 49	3123	43 55 10	3125
	α Arietis	E.	58 15 4	3242	56 49 44	3249	55 24 33	3257	53 59 31	3264
	Aldebaran	E.	90 9 37	3068	88 40 48	3069	87 12 0	3069	85 43 13	3070
	SUN	E.	122 12 33	3454	120 51 18	3455	119 30 4	3455	118 8 50	3454
3	Antares	W.	101 43 23	3129	103 10 58	3128	104 38 33	3126	106 6 11	3124
	α Aquilæ	W.	55 40 12	3733	56 56 24	3709	58 13 1	3686	59 30 3	3664
	SATURN	W.	30 3 22	3082	31 31 53	3077	33 0 31	3072	34 29 15	3067
	JUPITER	E.	36 36 51	3121	35 9 8	3119	33 41 22	3117	32 13 34	3115
	α Arietis	E.	46 56 39	3308	45 32 37	3318	44 8 46	3329	42 45 8	3342
	Aldebaran	E.	78 19 18	3066	76 50 27	3064	75 21 33	3061	73 52 35	3058
	SUN	E.	111 22 29	3448	110 1 7	3446	108 39 43	3442	107 18 15	3438
4	Antares	W.	113 25 9	3108	114 53 9	3104	116 21 13	3100	117 49 23	3095
	α Aquilæ	W.	66 0 50	3567	67 20 0	3550	68 39 29	3533	69 59 17	3516
	SATURN	W.	41 54 36	3037	43 24 3	3030	44 53 39	3022	46 23 24	3015
	JUPITER	E.	24 53 37	3096	23 25 23	3092	21 57 4	3087	20 28 39	3082
	α Arietis	E.	35 51 9	3430	34 29 25	3455	33 8 10	3484	31 47 28	3517
	Aldebaran	E.	66 26 42	3036	64 57 14	3030	63 27 38	3023	61 57 54	3016
	SUN	E.	100 29 41	3414	99 7 40	3408	97 45 32	3400	96 23 16	3393
5	α Aquilæ	W.	76 42 41	3439	78 4 13	3425	79 26 1	3410	80 48 6	3396
	SATURN	W.	53 54 39	2971	55 25 28	2961	56 56 29	2950	58 27 44	2940
	Aldebaran	E.	54 27 0	2976	52 56 18	2967	51 25 24	2957	49 54 17	2946
	SUN	E.	89 29 36	3349	88 6 21	3337	86 42 53	3326	85 19 12	3315
6	α Aquilæ	W.	87 42 29	3328	89 6 8	3314	90 30 3	3301	91 54 13	3289
	SATURN	W.	66 7 31	2880	67 40 15	2867	69 13 16	2854	70 46 34	2840
	Aldebaran	E.	42 15 16	2889	40 42 43	2876	39 9 53	2862	37 36 46	2849
	SUN	E.	78 17 25	3253	76 52 19	3240	75 26 57	3225	74 1 18	3211
7	α Aquilæ	W.	98 58 38	3230	100 24 12	3219	101 49 59	3209	103 15 58	3199
	SATURN	W.	78 37 39	2767	80 12 50	2751	81 48 22	2736	83 24 14	2719
	α Pegasi	W.	51 12 38	3204	52 38 43	3171	54 5 26	3139	55 32 48	3107
	Aldebaran	E.	29 46 42	2777	28 11 44	2762	26 36 26	2746	25 0 47	2730
	SUN	E.	66 48 35	3133	65 21 5	3117	63 53 16	3101	62 25 8	3084
8	α Aquilæ	W.	110 28 32	3160	111 55 29	3156	113 22 32	3152	114 49 39	3149
	SATURN	W.	91 29 1	2637	93 7 6	2621	94 45 33	2603	96 24 24	2585
	α Pegasi	W.	62 58 42	2969	64 29 34	2942	66 0 59	2917	67 32 56	2893
	JUPITER	W.	24 12 6	2699	25 48 47	2681	27 25 53	2662	29 3 24	2644
	SUN	E.	54 59 9	2997	53 28 52	2980	51 58 14	2962	50 27 13	2944
9	SATURN	W.	104 44 34	2499	106 25 48	2483	108 7 24	2467	109 49 24	2450
	α Pegasi	W.	75 20 11	2780	76 55 5	2760	78 30 25	2739	80 6 13	2719

GREENWICH MEAN TIME.										
LUNAR DISTANCES.										
Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
9	JUPITER	W.	30 41 19	2626	32 19 39	2607	33 58 24	2589	35 37 34	2571
	SUN	E.	48 55 50	2927	47 24 5	2909	45 51 58	2892	44 19 29	2874
10	$\alpha$ Pegasi	W.	81 42 28	2700	83 19 8	2681	84 56 13	2663	86 33 43	2646
	JUPITER	W.	43 59 34	2482	45 41 12	2465	47 23 14	2448	49 5 41	2431
	SUN	E.	36 31 34	2792	34 56 56	2777	33 21 58	2763	31 46 42	2750
15	SUN	W.	31 30 31	2424	33 13 31	2424	34 56 32	2424	36 39 33	2423
	Spica	E.	58 29 48	2113	56 39 8	2116	54 48 32	2120	52 58 3	2125
	Antares	E.	104 13 25	2155	102 23 49	2157	100 34 16	2159	98 44 47	2163
16	SUN	W.	45 13 46	2444	46 56 18	2450	48 38 42	2456	50 20 57	2463
	Spica	E.	43 47 56	2160	41 58 28	2170	40 9 14	2180	38 20 17	2191
	Antares	E.	89 38 56	2188	87 50 11	2196	86 1 37	2203	84 13 14	2210
17	SUN	W.	58 49 29	2506	60 30 34	2515	62 11 26	2526	63 52 3	2536
	Regulus	W.	24 45 58	2212	26 34 8	2220	28 22 6	2228	30 9 52	2236
	Antares	E.	75 14 32	2259	73 27 32	2270	71 40 48	2281	69 54 21	2292
18	SUN	W.	72 11 26	2593	73 50 31	2605	75 29 19	2616	77 7 52	2629
	Regulus	W.	39 5 18	2286	40 51 38	2296	42 37 43	2307	44 23 32	2319
	Antares	E.	61 6 35	2359	59 22 1	2373	57 37 47	2388	55 53 55	2403
	$\alpha$ Aquilæ	E.	108 59 5	2769	107 23 57	2772	105 48 53	2775	104 13 53	2780
19	SUN	W.	85 16 24	2692	86 53 15	2704	88 29 49	2716	90 6 7	2730
	Regulus	W.	53 8 26	2377	54 52 34	2388	56 36 26	2400	58 20 1	2412
	Antares	E.	47 20 17	2489	45 38 48	2507	43 57 45	2527	42 17 10	2549
	$\alpha$ Aquilæ	E.	96 20 42	2815	94 46 34	2825	93 12 39	2835	91 38 57	2846
20	SUN	W.	98 3 19	2794	99 37 55	2806	101 12 15	2819	102 46 18	2831
	Regulus	W.	66 53 44	2470	68 35 39	2482	70 17 17	2494	71 58 39	2505
	$\alpha$ Aquilæ	E.	83 54 22	2913	82 22 20	2929	80 50 38	2945	79 19 16	2961
	SATURN	E.	103 51 19	2455	102 9 2	2467	100 27 2	2478	98 45 18	2489
21	SUN	W.	110 32 32	2894	112 4 59	2905	113 37 11	2917	115 9 8	2929
	Regulus	W.	80 21 30	2562	82 1 17	2573	83 40 49	2584	85 20 6	2594
	Spica	W.	27 6 40	2627	28 44 58	2633	30 23 8	2638	32 1 11	2644
	$\alpha$ Aquilæ	E.	71 47 56	3056	70 18 53	3078	68 50 16	3101	67 22 7	3124
	SATURN	E.	90 20 36	2545	88 40 26	2557	87 0 32	2568	85 20 53	2578
	Fomalhaut	E.	104 18 50	2927	102 47 5	2932	101 15 27	2939	99 43 58	2947
22	Regulus	W.	93 32 54	2647	95 10 45	2657	96 48 22	2667	98 25 46	2678
	Spica	W.	40 9 18	2679	41 46 26	2687	43 23 23	2695	45 0 10	2704
	$\alpha$ Aquilæ	E.	60 8 58	3261	58 44 1	3293	57 19 41	3326	55 56 0	3363
	SATURN	E.	77 6 15	2632	75 28 3	2641	73 50 4	2652	72 12 19	2661
	Fomalhaut	E.	92 9 3	2989	90 38 37	3000	89 8 24	3010	87 38 23	3021
	$\alpha$ Pegasi	E.	107 6 8	2924	105 34 20	2931	104 2 40	2937	102 31 7	2943
23	Regulus	W.	106 29 28	2725	108 5 34	2735	109 41 28	2744	111 17 10	2753
	Spica	W.	53 1 16	2745	54 36 56	2753	56 12 25	2762	57 47 43	2769
	$\alpha$ Aquilæ	E.	49 8 48	3583	47 49 55	3637	46 32 1	3695	45 15 9	3760
	SATURN	E.	64 6 52	2710	62 30 26	2719	60 54 12	2729	59 18 10	2738

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XV <sup>h</sup>	P. L. of Diff.	XVIII <sup>h</sup>	P. L. of Diff.	XXI <sup>h</sup>	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
9	JUPITER W.	37 17 9	2553	38 57 8	2535	40 37 32	2517	42 18 21	2500
	SUN E.	42 46 37	2857	41 13 23	2841	39 39 48	2824	38 5 51	2808
10	α Pegasi W.	88 11 36	2629	89 49 52	2613	91 28 29	2598	93 7 27	2583
	JUPITER W.	50 48 32	2415	52 31 46	2398	54 15 24	2382	55 59 25	2366
	SUN E.	30 11 9	2738	28 35 20	2726	26 59 15	2716	25 22 56	2706
15	SUN W.	38 22 32	2427	40 5 28	2430	41 48 20	2434	43 31 6	2438
	Spica E.	51 7 42	2131	49 17 30	2137	47 27 28	2144	45 37 36	2152
	Antares E.	96 55 23	2167	95 6 5	2171	93 16 54	2176	91 27 51	2182
16	SUN W.	52 3 2	2471	53 44 56	2479	55 26 39	2487	57 8 10	2496
	Spica E.	36 31 36	2202	34 43 12	2215	32 55 7	2229	31 7 23	2244
	Antares E.	82 25 2	2219	80 37 3	2229	78 49 18	2239	77 1 48	2249
17	SUN W.	65 32 26	2547	67 12 34	2558	68 52 27	2569	70 32 4	2580
	Regulus W.	31 57 26	2245	33 44 46	2256	35 31 51	2265	37 18 42	2275
	Antares E.	68 8 10	2305	66 22 18	2317	64 36 44	2331	62 51 30	2345
18	SUN W.	78 46 8	2641	80 24 7	2654	82 1 49	2666	83 39 15	2678
	Regulus W.	46 9 4	2330	47 54 20	2342	49 39 18	2353	51 24 0	2364
	Antares E.	54 10 25	2419	52 27 17	2436	50 44 33	2453	49 2 13	2470
	α Aquilæ E.	102 38 59	2785	101 4 12	2791	99 29 32	2798	97 55 2	2806
19	SUN W.	91 42 7	2743	93 17 50	2756	94 53 16	2768	96 28 26	2781
	Regulus W.	60 3 19	2424	61 46 20	2436	63 29 4	2447	65 11 32	2458
	Antares E.	40 37 5	2572	38 57 31	2595	37 18 28	2620	35 40 0	2647
	α Aquilæ E.	90 5 29	2859	88 32 17	2871	86 59 21	2885	85 26 43	2898
20	SUN W.	104 20 5	2845	105 53 35	2856	107 26 50	2869	108 59 49	2881
	Regulus W.	73 39 45	2517	75 20 35	2528	77 1 9	2540	78 41 27	2551
	α Aquilæ E.	77 48 14	2978	76 17 34	2997	74 47 18	3016	73 17 25	3035
	SATURN E.	97 3 50	2501	95 22 38	2512	93 41 42	2523	92 1 1	2535
21	SUN W.	116 40 50	2942	118 12 16	2953	119 43 28	2965	121 14 25	2976
	Regulus W.	86 59 9	2605	88 37 57	2616	90 16 30	2626	91 54 49	2637
	Spica W.	33 39 6	2650	35 16 53	2657	36 54 31	2664	38 31 59	2671
	α Aquilæ E.	65 54 27	3148	64 27 16	3175	63 0 37	3202	61 34 30	3231
	SATURN E.	83 41 28	2589	82 2 18	2600	80 23 23	2610	78 44 42	2621
	Fomalhaut E.	98 12 39	2954	96 41 29	2963	95 10 30	2971	93 39 41	2980
22	Regulus W.	100 2 56	2687	101 39 53	2697	103 16 37	2706	104 53 9	2716
	Spica W.	46 36 45	2712	48 13 9	2720	49 49 22	2728	51 25 25	2737
	α Aquilæ E.	54 33 1	3401	53 10 46	3441	51 49 16	3486	50 28 36	3533
	SATURN E.	70 34 47	2672	68 57 29	2681	67 20 24	2690	65 43 31	2701
	Fomalhaut E.	86 8 36	3032	84 39 2	3043	83 9 43	3055	81 40 38	3068
	α Pegasi E.	100 59 43	2950	99 28 27	2958	97 57 21	2965	96 26 24	2973
23	Regulus W.	112 52 40	2762	114 27 58	2771	116 3 4	2779	117 37 59	2788
	Spica W.	59 22 51	2779	60 57 47	2786	62 32 33	2794	64 7 9	2802
	α Aquilæ E.	43 59 25	3829	42 44 53	3905	41 31 38	3988	40 19 47	4079
	SATURN E.	57 42 21	2747	56 6 44	2757	54 31 20	2766	52 56 7	2775

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
23	Fomalhaut	E.	80 11 49	3080	78 43 15	3094	77 14 58	3107	75 46 57	3121
	α Pegasi	E.	94 55 37	2981	93 25 0	2989	91 54 33	2997	90 24 17	3006
24	Spica	W.	65 41 34	2811	67 15 48	2818	68 49 52	2826	70 23 46	2834
	SATURN	E.	51 21 6	2785	49 46 18	2793	48 11 41	2802	46 37 16	2811
	Fomalhaut	E.	66 31 21	3200	67 5 12	3219	65 39 25	3238	64 14 0	3257
	α Pegasi	E.	82 55 50	3055	81 26 45	3066	79 57 54	3077	78 29 16	3088
	JUPITER	E.	121 10 18	2825	119 36 22	2832	118 2 35	2840	116 28 59	2848
25	Spica	W.	78 10 45	2873	79 43 39	2880	81 16 23	2887	82 48 58	2894
	Antares	W.	33 19 53	3057	34 48 55	3051	36 18 5	3045	37 47 22	3041
	SATURN	E.	38 48 7	2857	37 14 53	2866	35 41 51	2876	34 9 1	2886
	Fomalhaut	E.	57 13 5	3372	55 50 16	3399	54 27 57	3427	53 6 11	3457
	α Pegasi	E.	71 9 40	3150	69 42 31	3163	68 15 38	3178	66 49 2	3192
	JUPITER	E.	108 43 39	2888	107 11 5	2894	105 38 39	2902	104 6 23	2910
	α Arietis	E.	114 26 21	3006	112 56 16	3011	111 26 17	3015	109 56 23	3020
26	Spica	W.	90 29 34	2931	92 1 14	2938	93 32 45	2944	95 4 8	2951
	Antares	W.	45 14 40	3035	46 44 9	3036	48 13 37	3037	49 43 4	3039
	Fomalhaut	E.	46 26 39	3646	45 8 54	3693	43 51 59	3744	42 35 58	3799
	α Pegasi	E.	59 40 37	3276	58 15 56	3295	56 51 38	3315	55 27 44	3336
	JUPITER	E.	96 27 22	2946	94 56 1	2952	93 24 48	2959	91 53 44	2965
	α Arietis	E.	102 28 24	3046	100 59 8	3052	99 29 59	3057	98 0 57	3063
27	Spica	W.	102 38 55	2985	104 9 27	2990	105 39 52	2996	107 10 9	3002
	Antares	W.	57 9 32	3053	58 38 39	3057	60 7 41	3061	61 36 38	3064
	α Pegasi	E.	48 34 48	3164	47 13 43	3495	45 53 13	3528	44 33 20	3564
	JUPITER	E.	84 20 24	2997	82 50 8	3003	81 19 59	3009	79 49 57	3015
	α Arietis	E.	90 37 36	3093	89 9 18	3100	87 41 8	3106	86 13 5	3112
	Aldebaran	E.	123 33 25	2968	122 2 32	2974	120 31 46	2980	119 1 8	2985
28	Antares	W.	69 0 22	3082	70 28 53	3086	71 57 19	3090	73 25 40	3093
	JUPITER	E.	72 21 33	3042	70 52 12	3047	69 22 57	3052	67 53 48	3056
	α Arietis	E.	78 54 45	3144	77 27 29	3151	76 0 20	3157	74 33 20	3163
	Aldebaran	E.	111 29 43	3013	109 59 46	3018	108 29 55	3022	107 0 10	3027
29	Antares	W.	80 46 26	3111	82 14 22	3114	83 42 15	3116	85 10 5	3119
	JUPITER	E.	60 29 23	3076	59 0 44	3080	57 32 10	3083	56 3 40	3086
	α Arietis	E.	67 20 18	3198	65 54 7	3205	64 28 4	3212	63 2 9	3220
	Aldebaran	E.	99 32 48	3047	98 3 34	3051	96 34 25	3054	95 5 19	3057
30	Antares	W.	92 28 25	3131	93 55 57	3133	95 23 27	3134	96 50 55	3136
	α Aquilæ	W.	47 55 22	3929	49 8 12	3892	50 21 40	3858	51 35 42	3828
	JUPITER	E.	48 42 0	3098	47 13 48	3100	45 45 38	3101	44 17 30	3102
	α Arietis	E.	55 54 48	3259	54 29 48	3268	53 4 59	3277	51 40 20	3287
	Aldebaran	E.	87 40 42	3069	86 11 55	3070	84 43 9	3072	83 14 25	3073
31	Antares	W.	104 7 55	3139	105 35 17	3140	107 2 38	3139	108 30 0	3139
	α Aquilæ	W.	57 53 3	3704	59 9 46	3684	60 26 49	3665	61 44 13	3647
	JUPITER	E.	36 57 4	3104	35 28 59	3104	34 0 54	3103	32 32 48	3102
	α Arietis	E.	44 40 8	3344	43 16 47	3358	41 53 43	3374	40 30 57	3392
	Aldebaran	E.	75 50 56	3073	74 22 14	3072	72 53 30	3071	71 24 45	3069



## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
23	Fomalhaut	E.	74 19 13	3136	72 51 47	3152	71 24 39	3168	69 57 51	3183
	α Pegasi	E.	88 54 12	3016	87 24 19	3025	85 54 37	3035	84 25 7	3045
24	Spica	W.	71 57 30	2842	73 31 3	2849	75 4 27	2857	76 37 41	2865
	SATURN	E.	45 3 2	2821	43 29 1	2829	41 55 11	2838	40 21 33	2848
	Fomalhaut	E.	62 48 59	3278	61 24 21	3300	60 0 9	3322	58 36 23	3346
	α Pegasi	E.	77 0 52	3100	75 32 42	3112	74 4 46	3124	72 37 5	3137
	JUPITER	E.	114 55 34	2857	113 22 20	2865	111 49 16	2873	110 16 22	2881
25	Spica	W.	84 21 24	2902	85 53 40	2909	87 25 47	2916	88 57 45	2924
	Antares	W.	39 16 45	3038	40 46 11	3036	42 15 39	3034	43 45 9	3034
	SATURN	E.	32 36 24	2896	31 4 0	2906	29 31 49	2917	27 59 52	2928
	Fomalhaut	E.	51 44 59	3490	50 24 24	3525	49 4 27	3562	47 45 11	3602
	α Pegasi	E.	65 22 43	3207	63 56 42	3224	62 31 1	3240	61 5 39	3257
	JUPITER	E.	102 34 17	2917	101 2 20	2924	99 30 32	2931	97 58 53	2938
	α Arietis	E.	108 26 35	3025	106 56 53	3030	105 27 17	3035	103 57 47	3040
26	Spica	W.	96 35 22	2958	98 6 28	2965	99 37 25	2971	101 8 14	2977
	Antares	W.	51 12 28	3042	52 41 49	3044	54 11 7	3047	55 40 21	3050
	Fomalhaut	E.	41 20 54	3859	40 6 53	3926	38 54 0	4001	37 42 21	4081
	α Pegasi	E.	54 4 14	3358	52 41 10	3382	51 18 33	3408	49 56 25	3435
	JUPITER	E.	90 22 48	2972	88 52 0	2978	87 21 20	2985	85 50 48	2991
	α Arietis	E.	96 32 2	3069	95 3 15	3075	93 34 35	3081	92 6 2	3087
27	Spica	W.	108 40 19	3008	110 10 21	3014	111 40 16	3020	113 10 3	3026
	Antares	W.	63 5 32	3068	64 34 21	3071	66 3 6	3075	67 31 46	3078
	α Pegasi	E.	43 14 6	3603	41 55 35	3646	40 37 50	3693	39 20 55	3745
	JUPITER	E.	78 20 3	3020	76 50 15	3026	75 20 35	3031	73 51 1	3036
	α Arietis	E.	84 45 9	3119	83 17 22	3124	81 49 42	3131	80 22 10	3137
	Aldebaran	E.	117 30 37	2991	116 0 13	2997	114 29 57	3002	112 59 47	3007
28	Antares	W.	74 53 58	3097	76 22 11	3101	77 50 20	3104	79 18 25	3107
	JUPITER	E.	66 24 44	3060	64 55 46	3065	63 26 54	3069	61 58 6	3073
	α Arietis	E.	73 6 27	3171	71 39 43	3177	70 13 6	3184	68 46 38	3191
	Aldebaran	E.	105 30 31	3032	104 0 58	3036	102 31 30	3040	101 2 7	3043
29	Antares	W.	86 37 51	3122	88 5 33	3124	89 33 13	3127	91 0 50	3129
	JUPITER	E.	54 35 13	3089	53 6 50	3092	51 38 31	3094	50 10 14	3096
	α Arietis	E.	61 36 23	3227	60 10 45	3235	58 45 17	3242	57 19 58	3250
	Aldebaran	E.	93 36 17	3060	92 7 19	3063	90 38 24	3065	89 9 32	3067
30	Antares	W.	98 18 21	3137	99 45 46	3138	101 13 10	3138	102 40 33	3139
	α Aquilæ	W.	52 50 15	3800	54 5 17	3773	55 20 47	3748	56 36 43	3726
	JUPITER	E.	42 49 23	3103	41 21 17	3105	39 53 13	3105	38 25 9	3104
	α Arietis	E.	50 15 53	3297	48 51 37	3307	47 27 34	3319	46 3 44	3331
	Aldebaran	E.	81 45 42	3073	80 17 0	3074	78 48 19	3074	77 19 38	3073
31	Antares	W.	109 57 22	3138	111 24 45	3138	112 52 9	3137	114 19 34	3135
	α Aquilæ	W.	63 1 57	3630	64 19 59	3614	65 38 18	3598	66 56 54	3583
	JUPITER	E.	31 4 41	3101	29 36 32	3100	28 8 22	3098	26 40 9	3096
	α Arietis	E.	39 8 31	3411	37 46 27	3432	36 24 47	3456	35 3 34	3483
	Aldebaran	E.	69 55 58	3068	68 27 9	3065	66 58 17	3062	65 29 22	3059

## AT GREENWICH APPARENT NOON.

Day of the Week	Day of the Month.	THE SUN'S						Equation of Time, to be Added to	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian	Subtracted from Apparent Time.	
Mon.	1	<sup>h</sup> 8 <sup>m</sup> 44 <sup>s</sup> 48.29	<sup>s</sup> 9.711	N. 18° 4' 28.2"	" - 37.62	15' 47.46"	66.63	<sup>m</sup> 6 <sup>s</sup> 7.89	<sup>s</sup> 0.145
Tues.	2	8 48 41.07	9.687	17 49 16.5	38.35	15 47.59	66.54	6 4.11	0.169
Wed.	3	8 52 33.26	9.663	17 33 47.4	39.07	15 47.71	66.45	5 59.78	0.193
Thur.	4	8 56 24.87	9.638	17 18 1.0	- 39.78	15 47.84	66.36	5 54.85	0.218
Frid.	5	9 0 15.88	9.614	17 1 57.8	40.48	15 47.98	66.27	5 49.31	0.242
Sat.	6	9 4 6.32	9.590	16 45 38.0	41.16	15 48.11	66.18	5 43.21	0.266
SUN.	7	9 7 56.19	9.566	16 29 1.9	- 41.84	15 48.25	66.09	5 36.53	0.290
Mon.	8	9 11 45.48	9.542	16 12 9.7	42.50	15 48.40	66.01	5 29.29	0.314
Tues.	9	9 15 34.19	9.518	15 55 1.9	43.14	15 48.55	65.92	5 21.48	0.338
Wed.	10	9 19 22.34	9.494	15 37 38.8	- 43.78	15 48.70	65.84	5 13.09	0.361
Thur.	11	9 23 9.92	9.471	15 20 0.6	44.40	15 48.86	65.76	5 4.14	0.384
Frid.	12	9 26 56.93	9.447	15 2 7.6	45.00	15 49.03	65.68	4 54.63	0.408
Sat.	13	9 30 43.38	9.424	14 44 0.4	- 45.60	15 49.20	65.60	4 44.55	0.432
SUN.	14	9 34 29.26	9.400	14 25 39.0	46.18	15 49.37	65.52	4 33.91	0.455
Mon.	15	9 38 14.59	9.377	14 7 3.8	46.74	15 49.55	65.44	4 22.71	0.478
Tues.	16	9 41 59.37	9.354	13 48 15.3	- 47.29	15 49.74	65.37	4 10.97	0.501
Wed.	17	9 45 43.60	9.332	13 29 13.8	47.83	15 49.93	65.29	3 58.69	0.523
Thur.	18	9 49 27.31	9.310	13 9 59.4	48.36	15 50.12	65.22	3 45.87	0.545
Frid.	19	9 53 10.49	9.289	12 50 32.5	- 48.87	15 50.31	65.15	3 32.54	0.566
Sat.	20	9 56 53.17	9.268	12 30 53.5	49.37	15 50.51	65.08	3 18.70	0.587
SUN.	21	10 0 35.35	9.248	12 11 2.7	49.86	15 50.71	65.01	3 4.36	0.607
Mon.	22	10 4 17.04	9.228	11 51 0.4	- 50.33	15 50.91	64.95	2 49.54	0.627
Tues.	23	10 7 58.28	9.209	11 30 46.8	50.79	15 51.12	64.88	2 34.27	0.646
Wed.	24	10 11 39.07	9.191	11 10 22.3	51.24	15 51.33	64.82	2 18.55	0.664
Thur.	25	10 15 19.43	9.173	10 49 47.2	- 51.68	15 51.54	64.76	2 2.40	0.682
Frid.	26	10 18 59.38	9.156	10 29 1.8	52.10	15 51.75	64.70	1 45.84	0.698
Sat.	27	10 22 38.93	9.140	10 8 6.4	52.51	15 51.97	64.64	1 28.89	0.714
SUN.	28	10 26 18.11	9.125	9 47 1.4	- 52.91	15 52.18	64.58	1 11.57	0.729
Mon.	29	10 29 56.93	9.110	9 25 46.9	53.29	15 52.40	64.53	0 53.88	0.744
Tues.	30	10 33 35.41	9.097	9 4 23.4	53.66	15 52.61	64.48	0 35.85	0.757
Wed.	31	10 37 13.57	9.084	8 42 51.1	54.02	15 52.83	64.43	0 17.51	0.770
Thur.	32	10 40 51.42	9.071	N. 8 21 10.4	- 54.36	15 53.05	64.38	0 1.13	0.782

NOTE.—The mean time of semidiameter passing the meridian may be found by subtracting 0.18 from the sidereal time.  
The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing.

## AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from		Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Added to Mean Time.			
		h m s	s	° ' "	"	m s	s		h m s
Mon.	1	8 44 47.30	9.712	N. 18 4 32.1	- 37.62	6 7.90	0.145		8 38 39.40
Tues.	2	8 48 40.09	9.687	17 49 20.4	38.35	6 4.13	0.169		8 42 35.96
Wed.	3	8 52 32.29	9.663	17 33 51.3	39.07	5 59.78	0.193		8 46 32.51
Thur.	4	8 56 23.92	9.639	17 18 5.0	- 39.78	5 54.85	0.218		8 50 29.07
Frid.	5	9 0 14.95	9.615	17 2 1.8	40.48	5 49.33	0.242		8 54 25.62
Sat.	6	9 4 5.41	9.591	16 45 41.9	41.17	5 43.23	0.266		8 58 22.17
SUN.	7	9 7 55.29	9.567	16 29 5.8	- 41.84	5 36.56	0.290		9 2 18.73
Mon.	8	9 11 44.60	9.542	16 12 13.6	42.50	5 29.32	0.314		9 6 15.28
Tues.	9	9 15 33.34	9.519	15 55 5.8	43.15	5 21.51	0.337		9 10 11.84
Wed.	10	9 19 21.51	9.495	15 37 42.6	- 43.78	5 13.12	0.361		9 14 8.39
Thur.	11	9 23 9.12	9.472	15 20 4.3	44.40	5 4.17	0.385		9 18 4.95
Frid.	12	9 26 56.16	9.448	15 2 11.3	45.01	4 54.66	0.408		9 22 1.50
Sat.	13	9 30 42.63	9.425	14 44 4.0	- 45.60	4 44.58	0.432		9 25 58.05
SUN.	14	9 34 28.55	9.402	14 25 42.5	46.18	4 33.94	0.455		9 29 54.61
Mon.	15	9 38 13.91	9.379	14 7 7.2	46.75	4 22.74	0.478		9 33 51.16
Tues.	16	9 41 58.72	9.356	13 48 18.6	- 47.30	4 11.00	0.500		9 37 47.72
Wed.	17	9 45 42.99	9.333	13 29 16.9	47.84	3 58.72	0.523		9 41 44.27
Thur.	18	9 49 26.72	9.311	13 10 2.4	48.37	3 45.90	0.545		9 45 40.82
Frid.	19	9 53 9.94	9.290	12 50 35.4	- 48.88	3 32.57	0.566		9 49 37.38
Sat.	20	9 56 52.66	9.269	12 30 56.3	49.38	3 18.73	0.587		9 53 33.93
SUN.	21	10 0 34.87	9.249	12 11 5.2	49.87	3 4.39	0.607		9 57 30.48
Mon.	22	10 4 16.61	9.229	11 51 2.7	- 50.34	2 49.57	0.627		10 1 27.04
Tues.	23	10 7 57.89	9.210	11 30 49.0	50.80	2 34.30	0.646		10 5 23.59
Wed.	24	10 11 38.72	9.192	11 10 24.3	51.25	2 18.58	0.664		10 9 20.14
Thur.	25	10 15 19.12	9.175	10 49 48.9	- 51.69	2 2.42	0.682		10 13 16.69
Frid.	26	10 18 59.11	9.158	10 29 3.3	52.11	1 45.86	0.698		10 17 13.25
Sat.	27	10 22 38.71	9.142	10 8 7.7	52.52	1 28.91	0.714		10 21 9.80
SUN.	28	10 26 17.93	9.127	9 47 2.4	- 52.92	1 11.58	0.730		10 25 6.35
Mon.	29	10 29 56.79	9.112	9 25 47.7	53.30	0 53.89	0.744		10 29 2.90
Tues.	30	10 33 35.32	9.098	9 4 23.9	53.67	0 35.86	0.758		10 32 59.46
Wed.	31	10 37 13.52	9.085	8 42 51.4	54.03	0 17.51	0.771		10 36 56.01
Thur.	32	10 40 51.43	9.073	N. 8 21 10.4	- 54.38	0 1.13	0.783		10 40 52.56

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.  
 The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing.

Diff. for 1 Hour,  
 + 9<sup>h</sup>.8565.  
 (Table III.)

AT GREENWICH MEAN NOON.								
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		°	'					
1	214	128 46 18.9	45 51.4	143.51	— 0.18	0.006 3846	— 22.8	h m s 15 18 49.66
2	215	129 43 43.6	43 16.0	143.56	0.29	0.006 3291	23.5	15 14 53.75
3	216	130 41 9.5	40 41.8	143.61	0.38	0.006 2720	24.2	15 10 57.84
4	217	131 38 36.7	38 8.8	143.66	— 0.46	0.006 2132	— 24.9	15 7 1.93
5	218	132 36 5.1	35 37.1	143.71	0.50	0.006 1526	25.6	15 3 6.02
6	219	133 33 34.8	33 6.7	143.76	0.53	0.006 0902	26.4	14 59 10.12
7	220	134 31 5.8	30 37.6	143.82	— 0.53	0.006 0257	— 27.3	14 55 14.21
8	221	135 28 38.2	28 9.8	143.87	0.49	0.005 9592	28.2	14 51 18.30
9	222	136 26 11.8	25 43.3	143.93	0.43	0.005 8904	29.1	14 47 22.39
10	223	137 23 46.8	23 18.2	143.98	— 0.33	0.005 8194	— 30.1	14 43 26.48
11	224	138 21 23.0	20 54.2	144.03	0.22	0.005 7460	31.1	14 39 30.57
12	225	139 19 0.4	18 31.5	144.08	— 0.08	0.005 6703	32.0	14 35 34.67
13	226	140 16 38.9	16 9.9	144.13	+ 0.07	0.005 5922	— 33.0	14 31 38.76
14	227	141 14 18.5	13 49.4	144.17	0.21	0.005 5119	33.9	14 27 42.85
15	228	142 11 59.1	11 29.9	144.22	0.34	0.005 4295	34.7	14 23 46.94
16	229	143 9 40.8	9 11.5	144.26	+ 0.47	0.005 3451	— 35.5	14 19 51.03
17	230	144 7 23.5	6 54.1	144.30	0.57	0.005 2589	36.3	14 15 55.13
18	231	145 5 7.3	4 37.8	144.35	0.65	0.005 1711	36.9	14 11 59.22
19	232	146 2 52.1	2 22.5	144.39	+ 0.69	0.005 0818	— 37.5	14 8 3.31
20	233	147 0 38.0	0 8.3	144.44	0.71	0.004 9912	38.0	14 4 7.40
21	234	147 58 25.1	57 55.3	144.49	0.69	0.004 8993	38.5	14 0 11.50
22	235	148 56 13.4	55 43.5	144.54	+ 0.65	0.004 8064	— 38.9	13 56 15.59
23	236	149 54 3.0	53 33.0	144.60	0.58	0.004 7125	39.3	13 52 19.68
24	237	150 51 54.0	51 23.9	144.65	0.48	0.004 6177	39.7	13 48 23.77
25	238	151 49 46.5	49 16.3	144.72	+ 0.38	0.004 5220	— 40.0	13 44 27.87
26	239	152 47 40.4	47 10.1	144.78	0.25	0.004 4255	40.4	13 40 31.96
27	240	153 45 35.9	45 5.5	144.85	0.12	0.004 3282	40.7	13 36 36.05
28	241	154 43 33.1	43 2.6	144.92	+ 0.01	0.004 2301	— 41.0	13 32 40.15
29	242	155 41 32.0	41 1.4	144.99	— 0.12	0.004 1312	41.4	13 28 44.24
30	243	156 39 32.6	39 1.9	145.06	0.22	0.004 0315	41.7	13 24 48.33
31	244	157 37 35.1	37 4.3	145.14	0.31	0.003 9310	42.1	13 20 52.43
32	245	158 35 39.5	35 8.6	145.22	— 0.36	0.003 8295	— 42.5	13 16 56.52

NOTE.—The longitudes in the column  $\lambda$  are referred to the true equinox of their own date, while those in the column  $\lambda'$  are referred to the mean equinox of the beginning of the Besselian fictitious year.

Diff. for 1 Hour,  
— 9<sup>h</sup> 82.96.  
(Table II.)

## GREENWICH MEAN TIME.

## THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	"	"	"	"	"	"	h m	m	d
1	14 48.2	14 50.3	54 13.6	+ 0.56	54 21.4	+ 0.74	16 7.6	1.78	19.3
2	14 53.0	14 56.4	54 31.5	0.93	54 43.9	1.13	16 50.8	1.83	20.3
3	15 0.5	15 5.1	54 58.7	1.33	55 15.8	1.52	17 35.7	1.92	21.3
4	15 10.4	15 16.2	55 35.2	+ 1.70	55 56.7	+ 1.88	18 22.9	2.02	22.3
5	15 22.6	15 29.5	56 20.2	2.03	56 45.5	2.17	19 12.9	2.15	23.3
6	15 36.8	15 44.4	57 12.2	2.27	57 40.0	2.34	20 6.2	2.28	24.3
7	15 52.1	15 59.8	58 8.3	+ 2.36	58 36.7	+ 2.34	21 2.4	2.39	25.3
8	16 7.4	16 14.6	59 4.5	2.26	59 31.1	2.13	22 0.8	2.46	26.3
9	16 21.3	16 27.3	59 55.7	1.94	60 17.8	1.70	23 0.2	2.48	27.3
10	16 32.4	16 36.5	60 36.5	+ 1.40	60 51.5	+ 1.07	23 59.4	2.44	28.3
11	16 39.4	16 41.1	61 2.2	+ 0.70	61 8.2	+ 0.30	0		29.3
12	16 41.4	16 40.5	61 9.5	- 0.09	61 6.1	- 0.47	0 57.4	2.38	1.0
13	16 38.4	16 35.1	60 58.3	- 0.83	60 46.2	- 1.15	1 53.8	2.31	2.0
14	16 30.8	16 25.6	60 30.5	1.44	60 11.6	1.67	2 48.6	2.25	3.0
15	16 19.8	16 13.5	59 50.3	1.85	59 27.1	1.98	3 42.1	2.21	4.0
16	16 6.9	16 0.1	59 2.7	- 2.06	58 37.6	- 2.10	4 34.8	2.18	5.0
17	15 53.2	15 46.4	58 12.4	2.09	57 47.5	2.05	5 27.0	2.17	6.0
18	15 39.8	15 33.5	57 23.2	1.98	56 59.9	1.89	6 19.0	2.16	7.0
19	15 27.4	15 21.8	56 37.8	- 1.78	56 17.0	- 1.67	7 10.6	2.14	8.0
20	15 16.5	15 11.7	55 57.7	1.55	55 39.9	1.42	8 1.6	2.11	9.0
21	15 7.2	15 3.2	55 23.6	1.29	55 8.9	1.16	8 51.7	2.06	10.0
22	14 59.6	14 56.5	54 55.7	- 1.04	54 44.0	- 0.92	9 40.5	2.00	11.0
23	14 53.6	14 51.2	54 33.6	0.80	54 24.7	0.69	10 27.8	1.94	12.0
24	14 49.1	14 47.4	54 17.1	0.58	54 10.8	0.47	11 13.6	1.87	13.0
25	14 46.0	14 45.0	54 5.7	- 0.36	54 2.0	- 0.26	11 57.9	1.82	14.0
26	14 44.3	14 44.0	53 59.5	- 0.15	53 58.4	- 0.04	12 41.0	1.78	15.0
27	14 44.1	14 44.5	53 58.6	+ 0.08	54 0.2	+ 0.20	13 23.5	1.76	16.0
28	14 45.4	14 46.6	54 3.3	+ 0.32	54 8.0	+ 0.46	14 5.8	1.77	17.0
29	14 48.4	14 50.6	54 14.3	0.60	54 22.4	0.75	14 48.6	1.81	18.0
30	14 53.3	14 56.5	54 32.3	0.90	54 44.1	1.07	15 32.5	1.86	19.0
31	15 0.2	15 4.5	54 57.9	1.23	55 13.7	1.40	16 18.0	1.94	20.0
32	15 9.4	15 14.8	55 31.5	+ 1.57	55 51.3	+ 1.73	17 5.8	2.04	21.0

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 1.					WEDNESDAY 3.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	18 28.49	1.8777	N. 0 29 36.8	9.348	0	1 50 9.09	1.9607	N. 7 48 36.1	8.723
1	0 20 21.17	1.8782	0 38 57.7	9.348	1	1 52 6.82	1.9636	7 57 18.7	8.696
2	0 22 13.88	1.8788	0 48 18.6	9.348	2	1 54 4.72	1.9665	8 5 59.6	8.668
3	0 24 6.63	1.8796	0 57 39.5	9.347	3	1 56 2.80	1.9695	8 14 38.8	8.638
4	0 25 59.43	1.8803	1 7 0.3	9.346	4	1 58 1.06	1.9725	8 23 16.2	8.609
5	0 27 52.27	1.8811	1 16 21.0	9.343	5	1 59 59.50	1.9756	8 31 51.9	8.579
6	0 29 45.16	1.8820	1 25 41.5	9.341	6	2 1 58.13	1.9788	8 40 25.7	8.548
7	0 31 38.11	1.8829	1 35 1.9	9.337	7	2 3 56.95	1.9819	8 48 57.7	8.517
8	0 33 31.11	1.8838	1 44 22.0	9.333	8	2 5 55.96	1.9852	8 57 27.8	8.485
9	0 35 24.17	1.8848	1 53 41.9	9.330	9	2 7 55.17	1.9884	9 5 55.9	8.453
10	0 37 17.29	1.8858	2 3 1.6	9.326	10	2 9 54.57	1.9917	9 14 22.1	8.419
11	0 39 10.47	1.8869	2 12 21.0	9.320	11	2 11 54.17	1.9951	9 22 46.2	8.384
12	0 41 3.72	1.8881	2 21 40.0	9.314	12	2 13 53.98	1.9985	9 31 8.2	8.349
13	0 42 57.04	1.8892	2 30 58.7	9.307	13	2 15 53.99	2.0019	9 39 28.1	8.314
14	0 44 50.43	1.8904	2 40 16.9	9.300	14	2 17 54.21	2.0054	9 47 45.9	8.278
15	0 46 43.89	1.8918	2 49 34.7	9.293	15	2 19 54.64	2.0089	9 56 1.5	8.241
16	0 48 37.44	1.8931	2 58 52.0	9.285	16	2 21 55.28	2.0125	10 4 14.8	8.203
17	0 50 31.06	1.8943	3 8 8.9	9.277	17	2 23 56.14	2.0162	10 12 25.9	8.165
18	0 52 24.76	1.8957	3 17 25.2	9.267	18	2 25 57.22	2.0198	10 20 34.6	8.126
19	0 54 18.55	1.8973	3 26 40.9	9.257	19	2 27 58.52	2.0235	10 28 41.0	8.087
20	0 56 12.44	1.8988	3 35 56.0	9.247	20	2 30 0.04	2.0273	10 36 45.0	8.046
21	0 58 6.41	1.9003	3 45 10.5	9.237	21	2 32 1.79	2.0310	10 44 46.5	8.005
22	1 0 0.48	1.9020	3 54 24.4	9.225	22	2 34 3.76	2.0348	10 52 45.6	7.963
23	1 1 54.65	1.9037	N. 4 3 37.5	9.212	23	2 36 5.97	2.0387	N. 11 0 42.1	7.920
TUESDAY 2.					THURSDAY 4.				
0	1 3 48.92	1.9053	N. 4 12 49.8	9.199	0	2 38 8.41	2.0427	N. 11 8 36.0	7.877
1	1 5 43.29	1.9071	4 22 1.4	9.187	1	2 40 11.09	2.0466	11 16 27.3	7.833
2	1 7 37.77	1.9089	4 31 12.2	9.173	2	2 42 14.00	2.0505	11 24 15.9	7.788
3	1 9 32.36	1.9108	4 40 22.2	9.159	3	2 44 17.15	2.0546	11 32 1.8	7.743
4	1 11 27.06	1.9126	4 49 31.3	9.144	4	2 46 20.55	2.0587	11 39 45.0	7.696
5	1 13 21.87	1.9145	4 58 39.5	9.129	5	2 48 24.20	2.0628	11 47 25.3	7.648
6	1 15 16.80	1.9166	5 7 46.8	9.113	6	2 50 28.09	2.0669	11 55 2.8	7.601
7	1 17 11.86	1.9187	5 16 53.1	9.097	7	2 52 32.23	2.0711	12 2 37.4	7.552
8	1 19 7.04	1.9207	5 25 58.4	9.079	8	2 54 36.62	2.0753	12 10 9.0	7.503
9	1 21 2.34	1.9228	5 35 2.6	9.061	9	2 56 41.26	2.0795	12 17 37.7	7.453
10	1 22 57.77	1.9250	5 44 5.7	9.043	10	2 58 46.16	2.0838	12 25 3.3	7.401
11	1 24 53.34	1.9273	5 53 7.7	9.024	11	3 0 51.32	2.0882	12 32 25.8	7.349
12	1 26 49.04	1.9295	6 2 8.6	9.005	12	3 2 56.74	2.0925	12 39 45.2	7.297
13	1 28 44.88	1.9318	6 11 8.3	8.985	13	3 5 2.42	2.0969	12 47 1.4	7.243
14	1 30 40.86	1.9342	6 20 6.8	8.964	14	3 7 8.37	2.1013	12 54 14.4	7.189
15	1 32 36.99	1.9367	6 29 4.0	8.943	15	3 9 14.58	2.1058	13 1 24.1	7.134
16	1 34 33.26	1.9392	6 37 59.9	8.921	16	3 11 21.06	2.1103	13 8 30.5	7.079
17	1 36 29.69	1.9417	6 46 54.5	8.898	17	3 13 27.81	2.1148	13 15 33.6	7.022
18	1 38 26.27	1.9443	6 55 47.7	8.875	18	3 15 34.83	2.1193	13 22 33.2	6.964
19	1 40 23.00	1.9468	7 4 39.5	8.852	19	3 17 42.12	2.1238	13 29 29.3	6.906
20	1 42 19.89	1.9495	7 13 29.9	8.827	20	3 19 49.69	2.1284	13 36 21.9	6.847
21	1 44 16.94	1.9523	7 22 18.7	8.802	21	3 21 57.53	2.1331	13 43 10.9	6.787
22	1 46 14.16	1.9550	7 31 6.1	8.777	22	3 24 5.66	2.1378	13 49 56.3	6.727
23	1 48 11.54	1.9578	7 39 51.9	8.750	23	3 26 14.06	2.1423	13 56 38.1	6.665
24	1 50 9.09	1.9607	N. 7 48 36.1	8.723	24	3 28 22.74	2.1471	N. 14 3 16.1	6.603

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 5.					SUNDAY 7.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	3 28 22.74	2.1471	N. 14 3 16.1	6.603	0	5 17 5.00	2.3812	N. 17 51 38.2	2.576
1	3 30 31.71	2.1518	14 9 50.4	6.539	1	5 19 28.01	2.3858	17 54 9.6	2.471
2	3 32 40.96	2.1566	14 16 20.8	6.475	2	5 21 51.29	2.3903	17 56 34.7	2.366
3	3 34 50.50	2.1613	14 22 47.4	6.410	3	5 24 14.84	2.3947	17 58 53.5	2.259
4	3 37 0.32	2.1661	14 29 10.0	6.344	4	5 26 38.65	2.3991	18 1 5.8	2.152
5	3 39 10.43	2.1709	14 35 28.7	6.277	5	5 29 2.73	2.4035	18 3 11.7	2.044
6	3 41 20.83	2.1758	14 41 43.3	6.209	6	5 31 27.07	2.4078	18 5 11.1	1.935
7	3 43 31.52	2.1807	14 47 53.8	6.141	7	5 33 51.67	2.4121	18 7 3.9	1.826
8	3 45 42.51	2.1855	14 54 0.2	6.072	8	5 36 16.52	2.4163	18 8 50.2	1.716
9	3 47 53.78	2.1903	15 0 2.4	6.002	9	5 38 41.63	2.4206	18 10 29.8	1.604
10	3 50 5.35	2.1952	15 6 0.4	5.931	10	5 41 6.99	2.4247	18 12 2.7	1.493
11	3 52 17.21	2.2002	15 11 54.1	5.858	11	5 43 32.59	2.4288	18 13 28.9	1.381
12	3 54 29.37	2.2052	15 17 43.4	5.785	12	5 45 58.44	2.4328	18 14 48.4	1.268
13	3 56 41.83	2.2101	15 23 28.3	5.712	13	5 48 24.53	2.4368	18 16 1.1	1.154
14	3 58 54.58	2.2150	15 29 8.8	5.638	14	5 50 50.86	2.4408	18 17 6.9	1.040
15	4 1 7.63	2.2200	15 34 44.8	5.562	15	5 53 17.42	2.4447	18 18 5.9	0.926
16	4 3 20.98	2.2250	15 40 16.2	5.485	16	5 55 44.22	2.4485	18 18 58.0	0.810
17	4 5 34.63	2.2300	15 45 43.1	5.409	17	5 58 11.24	2.4522	18 19 43.1	0.693
18	4 7 48.58	2.2349	15 51 5.3	5.330	18	6 0 38.48	2.4559	18 20 21.2	0.577
19	4 10 2.82	2.2399	15 56 22.7	5.251	19	6 3 5.95	2.4597	18 20 52.3	0.460
20	4 12 17.37	2.2449	16 1 35.4	5.171	20	6 5 33.64	2.4633	18 21 16.4	0.343
21	4 14 32.21	2.2499	16 6 43.2	5.090	21	6 8 1.54	2.4667	18 21 33.4	0.224
22	4 16 47.36	2.2549	16 11 46.2	5.009	22	6 10 29.64	2.4701	18 21 43.3	+ 0.105
23	4 19 2.80	2.2598	N. 16 16 44.3	4.926	23	6 12 57.95	2.4736	N. 18 21 46.0	- 0.014
SATURDAY 6.					MONDAY 8.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	4 21 18.54	2.2649	N. 16 21 37.3	4.842	0	6 15 26.47	2.4769	N. 18 21 41.6	0.133
1	4 23 34.59	2.2699	16 26 25.3	4.758	1	6 17 55.18	2.4802	18 21 30.0	0.254
2	4 25 50.93	2.2749	16 31 8.3	4.673	2	6 20 24.09	2.4834	18 21 11.1	0.375
3	4 28 7.58	2.2799	16 35 46.1	4.587	3	6 22 53.19	2.4865	18 20 45.0	0.496
4	4 30 24.52	2.2849	16 40 18.7	4.499	4	6 25 22.47	2.4895	18 20 11.6	0.618
5	4 32 41.77	2.2899	16 44 46.0	4.411	5	6 27 51.93	2.4924	18 19 30.9	0.739
6	4 34 59.31	2.2948	16 49 8.0	4.322	6	6 30 21.56	2.4953	18 18 42.9	0.862
7	4 37 17.15	2.2998	16 53 24.7	4.233	7	6 32 51.37	2.4982	18 17 47.5	0.985
8	4 39 35.28	2.3047	16 57 36.0	4.142	8	6 35 21.35	2.5010	18 16 44.7	1.108
9	4 41 53.71	2.3097	17 1 41.8	4.051	9	6 37 51.49	2.5037	18 15 34.6	1.231
10	4 44 12.44	2.3146	17 5 42.1	3.959	10	6 40 21.79	2.5063	18 14 17.0	1.355
11	4 46 31.46	2.3194	17 9 36.9	3.866	11	6 42 52.24	2.5088	18 12 52.0	1.478
12	4 48 50.77	2.3243	17 13 26.0	3.771	12	6 45 22.84	2.5113	18 11 19.6	1.602
13	4 51 10.38	2.3293	17 17 9.4	3.676	13	6 47 53.59	2.5137	18 9 39.7	1.727
14	4 53 30.28	2.3341	17 20 47.1	3.581	14	6 50 24.48	2.5159	18 7 52.4	1.851
15	4 55 50.47	2.3389	17 24 19.1	3.484	15	6 52 55.50	2.5181	18 5 57.6	1.977
16	4 58 10.95	2.3438	17 27 45.2	3.386	16	6 55 26.65	2.5202	18 3 55.2	2.102
17	5 0 31.72	2.3485	17 31 5.4	3.287	17	6 57 57.93	2.5223	18 1 45.4	2.226
18	5 2 52.77	2.3533	17 34 19.7	3.188	18	7 0 29.33	2.5243	17 59 28.1	2.351
19	5 5 14.11	2.3580	17 37 28.0	3.088	19	7 3 0.85	2.5262	17 57 3.3	2.477
20	5 7 35.73	2.3627	17 40 30.3	2.988	20	7 5 32.48	2.5280	17 54 30.9	2.602
21	5 9 57.03	2.3673	17 43 26.5	2.886	21	7 8 4.21	2.5297	17 51 51.1	2.727
22	5 12 19.81	2.3720	17 46 16.6	2.783	22	7 10 36.05	2.5314	17 49 3.7	2.853
23	5 14 42.27	2.3766	17 49 0.5	2.680	23	7 13 7.98	2.5329	17 46 8.8	2.978
24	5 17 5.00	2.3812	N. 17 51 38.2	2.575	24	7 15 40.00	2.5344	N. 17 43 6.4	3.103

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 9.					THURSDAY 11.				
0	7 15 40.00	2.5344	N. 17 43 6.4	3.103	0	9 17 31.46	2.5156	N. 12 56 44.2	8.573
1	7 18 12.11	2.5358	17 39 56.5	3.228	1	9 20 2.34	2.5137	12 48 7.0	8.666
2	7 20 44.30	2.5372	17 36 39.1	3.353	2	9 22 33.10	2.5117	12 39 24.3	8.757
3	7 23 16.57	2.5384	17 33 14.2	3.478	3	9 25 3.74	2.5096	12 30 36.1	8.848
4	7 25 48.91	2.5396	17 29 41.8	3.603	4	9 27 34.25	2.5075	12 21 42.5	8.937
5	7 28 21.32	2.5407	17 26 1.9	3.728	5	9 30 4.64	2.5055	12 12 43.6	9.025
6	7 30 53.79	2.5417	17 22 14.5	3.852	6	9 32 34.91	2.5034	12 3 39.5	9.112
7	7 33 26.32	2.5426	17 18 19.7	3.976	7	9 35 5.05	2.5012	11 54 30.2	9.198
8	7 35 58.90	2.5433	17 14 17.4	4.100	8	9 37 35.05	2.4989	11 45 15.8	9.282
9	7 38 31.52	2.5441	17 10 7.7	4.224	9	9 40 4.92	2.4967	11 35 56.4	9.364
10	7 41 4.19	2.5448	17 5 50.5	4.347	10	9 42 34.65	2.4944	11 26 32.1	9.445
11	7 43 36.89	2.5453	17 1 26.0	4.470	11	9 45 4.25	2.4922	11 17 3.0	9.526
12	7 46 9.63	2.5458	16 56 54.1	4.593	12	9 47 33.71	2.4898	11 7 29.0	9.605
13	7 48 42.39	2.5463	16 52 14.8	4.716	13	9 50 3.03	2.4874	10 57 50.4	9.682
14	7 51 15.18	2.5466	16 47 28.2	4.838	14	9 52 32.20	2.4850	10 48 7.2	9.758
15	7 53 47.98	2.5468	16 42 34.3	4.959	15	9 55 1.23	2.4826	10 38 19.5	9.833
16	7 56 20.80	2.5470	16 37 33.1	5.080	16	9 57 30.11	2.4802	10 28 27.3	9.906
17	7 58 53.62	2.5471	16 32 24.7	5.201	17	9 59 58.85	2.4778	10 18 30.8	9.978
18	8 1 26.45	2.5472	16 27 9.0	5.322	18	10 2 27.44	2.4753	10 8 30.0	10.048
19	8 3 59.28	2.5471	16 21 46.1	5.441	19	10 4 55.88	2.4728	9 58 25.0	10.117
20	8 6 32.10	2.5469	16 16 16.1	5.560	20	10 7 24.17	2.4702	9 48 16.0	10.184
21	8 9 4.91	2.5467	16 10 38.9	5.679	21	10 9 52.30	2.4677	9 38 2.9	10.251
22	8 11 37.70	2.5464	16 4 54.6	5.797	22	10 12 20.29	2.4652	9 27 45.9	10.315
23	8 14 10.48	2.5461	N. 15 59 3.3	5.913	23	10 14 48.12	2.4625	N. 9 17 25.1	10.377
WEDNESDAY 10.					FRIDAY 12.				
0	8 16 43.23	2.5456	N. 15 53 5.0	6.030	0	10 17 15.79	2.4599	N. 9 7 0.6	10.439
1	8 19 15.95	2.5451	15 46 59.7	6.147	1	10 19 43.31	2.4574	8 56 32.4	10.500
2	8 21 48.64	2.5445	15 40 47.4	6.263	2	10 22 10.68	2.4548	8 46 0.6	10.559
3	8 24 21.29	2.5438	15 34 28.2	6.377	3	10 24 37.89	2.4522	8 35 25.3	10.617
4	8 26 53.90	2.5432	15 28 2.2	6.490	4	10 27 4.94	2.4495	8 24 46.6	10.672
5	8 29 26.47	2.5424	15 21 29.4	6.603	5	10 29 31.83	2.4469	8 14 4.7	10.726
6	8 31 58.99	2.5415	15 14 49.9	6.715	6	10 31 58.57	2.4443	8 3 19.5	10.779
7	8 34 31.45	2.5406	15 8 3.6	6.827	7	10 34 25.15	2.4417	7 52 31.2	10.830
8	8 37 3.86	2.5396	15 1 10.6	6.938	8	10 36 51.57	2.4390	7 41 39.9	10.879
9	8 39 36.20	2.5385	14 54 11.1	7.047	9	10 39 17.83	2.4364	7 30 45.7	10.928
10	8 42 8.48	2.5374	14 47 5.0	7.156	10	10 41 43.94	2.4338	7 19 48.6	10.975
11	8 44 40.69	2.5362	14 39 52.4	7.264	11	10 44 9.89	2.4311	7 8 48.7	11.020
12	8 47 12.82	2.5349	14 32 33.3	7.371	12	10 46 35.67	2.4284	6 57 46.2	11.063
13	8 49 44.88	2.5336	14 25 7.9	7.477	13	10 49 1.30	2.4258	6 46 41.1	11.106
14	8 52 16.85	2.5322	14 17 36.1	7.582	14	10 51 26.77	2.4232	6 35 33.5	11.146
15	8 54 48.74	2.5308	14 9 58.1	7.685	15	10 53 52.08	2.4206	6 24 23.6	11.184
16	8 57 20.55	2.5294	14 2 13.9	7.788	16	10 56 17.24	2.4180	6 13 11.4	11.222
17	8 59 52.27	2.5278	13 54 23.5	7.890	17	10 58 42.24	2.4153	6 1 56.9	11.259
18	9 2 23.89	2.5262	13 46 27.1	7.991	18	11 1 7.08	2.4128	5 50 40.3	11.293
19	9 4 55.41	2.5245	13 38 24.6	8.091	19	11 3 31.77	2.4102	5 39 21.7	11.326
20	9 7 26.83	2.5228	13 30 16.2	8.189	20	11 5 56.30	2.4075	5 28 1.2	11.358
21	9 9 58.15	2.5211	13 22 1.9	8.287	21	11 8 20.67	2.4049	5 16 38.8	11.388
22	9 12 29.36	2.5193	13 13 41.7	8.384	22	11 10 44.89	2.4023	5 5 14.7	11.416
23	9 15 0.47	2.5175	13 5 15.8	8.479	23	11 13 8.95	2.3998	4 53 48.9	11.443
24	9 17 31.46	2.5156	N. 12 56 44.2	8.573	24	11 15 32.86	2.3973	N. 4 42 21.5	11.469



## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 13.					MONDAY 15.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	11 15 32.86	2.3973	N. 4 42 21.5	11.469	0	13 8 3.76	2.3005	S. 4 30 6.4	11.035
1	11 17 56.62	2.3947	4 30 52.6	11.492	1	13 10 21.75	2.2992	4 41 7.3	10.995
2	11 20 20.22	2.3922	4 19 22.4	11.514	2	13 12 39.66	2.2978	4 52 5.8	10.954
3	11 22 43.68	2.3897	4 7 50.9	11.536	3	13 14 57.49	2.2966	5 3 1.8	10.912
4	11 25 6.98	2.3872	3 56 18.1	11.556	4	13 17 15.25	2.2953	5 13 55.3	10.869
5	11 27 30.14	2.3848	3 44 44.2	11.573	5	13 19 32.93	2.2940	5 24 46.1	10.824
6	11 29 53.15	2.3823	3 33 9.3	11.589	6	13 21 50.53	2.2928	5 35 34.2	10.779
7	11 32 16.01	2.3798	3 21 33.5	11.604	7	13 24 8.06	2.2916	5 46 19.6	10.733
8	11 34 38.73	2.3774	3 9 56.8	11.618	8	13 26 25.52	2.2904	5 57 2.1	10.685
9	11 37 1.30	2.3750	2 58 19.3	11.631	9	13 28 42.91	2.2893	6 7 41.8	10.637
10	11 39 23.73	2.3726	2 46 41.1	11.642	10	13 31 0.23	2.2882	6 18 18.6	10.588
11	11 41 46.01	2.3702	2 35 2.3	11.650	11	13 33 17.49	2.2871	6 28 52.4	10.538
12	11 44 8.15	2.3678	2 23 23.1	11.658	12	13 35 34.68	2.2860	6 39 23.2	10.487
13	11 46 30.15	2.3656	2 11 43.4	11.664	13	13 37 51.81	2.2850	6 49 50.8	10.434
14	11 48 52.02	2.3633	2 0 3.4	11.668	14	13 40 8.88	2.2839	7 0 15.3	10.381
15	11 51 13.74	2.3609	1 48 23.2	11.672	15	13 42 25.88	2.2829	7 10 36.5	10.327
16	11 53 35.33	2.3587	1 36 42.8	11.673	16	13 44 42.83	2.2820	7 20 54.5	10.272
17	11 55 56.79	2.3566	1 25 2.4	11.674	17	13 46 59.72	2.2810	7 31 9.1	10.216
18	11 58 18.12	2.3543	1 13 21.9	11.673	18	13 49 16.55	2.2800	7 41 20.4	10.159
19	12 0 39.31	2.3521	1 1 41.6	11.671	19	13 51 33.32	2.2791	7 51 28.2	10.101
20	12 3 0.37	2.3500	0 50 1.4	11.668	20	13 53 50.04	2.2783	8 1 32.5	10.043
21	12 5 21.31	2.3478	0 38 21.5	11.663	21	13 56 6.71	2.2774	8 11 33.3	9.983
22	12 7 42.11	2.3457	0 26 41.9	11.656	22	13 58 23.33	2.2766	8 21 30.5	9.923
23	12 10 2.79	2.3437	N. 0 15 2.8	11.648	23	14 0 39.90	2.2758	S. 8 31 24.0	9.861
SUNDAY 14.					TUESDAY 16.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	12 12 23.35	2.3417	N. 0 3 24.2	11.638	0	14 2 56.42	2.2749	S. 8 41 13.8	9.798
1	12 14 43.79	2.3396	S. 0 8 13.8	11.628	1	14 5 12.89	2.2742	8 50 59.8	9.736
2	12 17 4.10	2.3376	0 19 51.2	11.617	2	14 7 29.32	2.2734	9 0 42.1	9.673
3	12 19 24.30	2.3357	0 31 27.8	11.603	3	14 9 45.70	2.2727	9 10 20.5	9.608
4	12 21 44.38	2.3337	0 43 3.5	11.588	4	14 12 2.04	2.2720	9 19 55.0	9.542
5	12 24 4.34	2.3317	0 54 38.4	11.572	5	14 14 18.34	2.2713	9 29 25.5	9.475
6	12 26 24.19	2.3298	1 6 12.2	11.555	6	14 16 34.59	2.2706	9 38 52.0	9.408
7	12 28 43.92	2.3280	1 17 45.0	11.538	7	14 18 50.81	2.2699	9 48 14.5	9.341
8	12 31 3.55	2.3262	1 29 16.7	11.518	8	14 21 6.98	2.2693	9 57 32.9	9.273
9	12 33 23.06	2.3243	1 40 47.1	11.496	9	14 23 23.12	2.2687	10 6 47.2	9.203
10	12 35 42.47	2.3226	1 52 16.2	11.473	10	14 25 39.22	2.2680	10 15 57.3	9.133
11	12 38 1.77	2.3208	2 3 43.9	11.450	11	14 27 55.28	2.2673	10 25 3.2	9.063
12	12 40 20.96	2.3190	2 15 10.2	11.426	12	14 30 11.30	2.2668	10 34 4.8	8.991
13	12 42 40.05	2.3173	2 26 35.0	11.400	13	14 32 27.29	2.2663	10 43 2.1	8.918
14	12 44 59.04	2.3157	2 37 58.2	11.372	14	14 34 43.25	2.2658	10 51 55.0	8.846
15	12 47 17.93	2.3141	2 49 19.7	11.344	15	14 36 59.18	2.2652	11 0 43.6	8.773
16	12 49 36.73	2.3125	3 0 39.5	11.314	16	14 39 15.07	2.2646	11 9 27.7	8.698
17	12 51 55.43	2.3108	3 11 57.4	11.283	17	14 41 30.93	2.2641	11 18 7.4	8.624
18	12 54 14.03	2.3093	3 23 13.5	11.252	18	14 43 46.76	2.2636	11 26 42.6	8.548
19	12 56 32.54	2.3078	3 34 27.6	11.218	19	14 46 2.56	2.2631	11 35 13.2	8.473
20	12 58 50.96	2.3063	3 45 39.7	11.184	20	14 48 18.33	2.2626	11 43 39.3	8.396
21	13 1 9.29	2.3048	3 56 49.7	11.148	21	14 50 34.07	2.2622	11 52 0.7	8.318
22	13 3 27.53	2.3033	4 7 57.5	11.112	22	14 52 49.79	2.2617	12 0 17.5	8.240
23	13 5 45.69	2.3019	4 19 3.1	11.074	23	14 55 5.47	2.2612	12 8 29.5	8.161
24	13 8 3.76	2.3005	S. 4 30 6.4	11.035	24	14 57 21.13	2.2608	S. 12 16 36.8	8.082

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 17.					FRIDAY 19.				
0	14 57 21.13	2.2608	S. 12 16 36.8	8.082	0	16 45 21.54	2.2371	S. 17 4 42.8	3.791
1	14 59 36.76	2.2603	12 24 39.4	8.003	1	16 47 35.74	2.2363	17 8 27.4	3.695
2	15 1 52.37	2.2599	12 32 37.1	7.922	2	16 49 49.90	2.2356	17 12 6.2	3.599
3	15 4 7.95	2.2594	12 40 30.0	7.842	3	16 52 4.01	2.2348	17 15 39.3	3.503
4	15 6 23.50	2.2590	12 48 18.1	7.761	4	16 54 18.08	2.2341	17 19 6.6	3.407
5	15 8 39.03	2.2586	12 56 1.3	7.678	5	16 56 32.10	2.2332	17 22 28.1	3.311
6	15 10 54.53	2.2581	13 3 39.5	7.596	6	16 58 46.06	2.2323	17 25 43.9	3.215
7	15 13 10.00	2.2577	13 11 12.8	7.513	7	17 0 59.97	2.2314	17 28 53.9	3.119
8	15 15 25.45	2.2573	13 18 41.1	7.430	8	17 3 13.83	2.2306	17 31 58.2	3.023
9	15 17 40.88	2.2569	13 26 4.4	7.347	9	17 5 27.64	2.2297	17 34 56.6	2.926
10	15 19 56.28	2.2565	13 33 22.7	7.263	10	17 7 41.39	2.2287	17 37 49.3	2.830
11	15 22 11.66	2.2562	13 40 35.9	7.177	11	17 9 55.08	2.2277	17 40 36.2	2.733
12	15 24 27.02	2.2558	13 47 43.9	7.091	12	17 12 8.71	2.2267	17 43 17.3	2.637
13	15 26 42.35	2.2553	13 54 46.8	7.005	13	17 14 22.29	2.2258	17 45 52.6	2.540
14	15 28 57.66	2.2549	14 1 44.5	6.919	14	17 16 35.80	2.2247	17 48 22.1	2.444
15	15 31 12.94	2.2545	14 8 37.1	6.833	15	17 18 49.25	2.2237	17 50 45.9	2.348
16	15 33 28.20	2.2542	14 15 24.5	6.746	16	17 21 2.64	2.2226	17 53 3.8	2.251
17	15 35 43.44	2.2538	14 22 6.6	6.658	17	17 23 15.96	2.2215	17 55 16.0	2.155
18	15 37 58.65	2.2533	14 28 43.4	6.570	18	17 25 29.22	2.2204	17 57 22.4	2.058
19	15 40 13.83	2.2528	14 35 15.0	6.482	19	17 27 42.41	2.2193	17 59 22.9	1.961
20	15 42 28.99	2.2524	14 41 41.2	6.393	20	17 29 55.53	2.2181	18 1 17.7	1.866
21	15 44 44.12	2.2520	14 48 2.1	6.304	21	17 32 8.58	2.2169	18 3 6.8	1.769
22	15 46 59.23	2.2517	14 54 17.7	6.215	22	17 34 21.56	2.2157	18 4 50.0	1.673
23	15 49 14.32	2.2513	S. 15 0 27.9	6.125	23	17 36 34.46	2.2144	S. 18 6 27.5	1.577
THURSDAY 18.					SATURDAY 20.				
0	15 51 29.38	2.2508	S. 15 6 32.7	6.035	0	17 38 47.29	2.2132	S. 18 7 59.2	1.481
1	15 53 44.41	2.2503	15 12 32.1	5.944	1	17 41 0.04	2.2119	18 9 25.2	1.385
2	15 55 59.42	2.2499	15 18 26.0	5.853	2	17 43 12.72	2.2107	18 10 45.4	1.288
3	15 58 14.40	2.2494	15 24 14.5	5.762	3	17 45 25.32	2.2095	18 11 59.8	1.193
4	16 0 29.35	2.2489	15 29 57.4	5.670	4	17 47 37.84	2.2080	18 13 8.5	1.098
5	16 2 44.27	2.2485	15 35 34.9	5.579	5	17 49 50.28	2.2066	18 14 11.5	1.003
6	16 4 59.17	2.2480	15 41 6.9	5.487	6	17 52 2.63	2.2052	18 15 8.8	0.907
7	16 7 14.03	2.2475	15 46 33.4	5.395	7	17 54 14.90	2.2038	18 16 0.3	0.811
8	16 9 28.87	2.2470	15 51 54.3	5.302	8	17 56 27.08	2.2023	18 16 46.1	0.716
9	16 11 43.67	2.2464	15 57 9.6	5.208	9	17 58 39.17	2.2008	18 17 26.2	0.621
10	16 13 58.44	2.2459	16 2 19.3	5.116	10	18 0 51.17	2.1993	18 18 0.6	0.527
11	16 16 13.18	2.2454	16 7 23.5	5.023	11	18 3 3.09	2.1978	18 18 29.4	0.432
12	16 18 27.89	2.2449	16 12 22.0	4.928	12	18 5 14.91	2.1963	18 18 52.4	0.337
13	16 20 42.57	2.2443	16 17 14.9	4.835	13	18 7 26.64	2.1948	18 19 9.8	0.243
14	16 22 57.21	2.2437	16 22 2.2	4.742	14	18 9 38.28	2.1932	18 19 21.5	0.148
15	16 25 11.81	2.2431	16 26 43.9	4.648	15	18 11 49.82	2.1915	18 19 27.6	-0.055
16	16 27 26.38	2.2425	16 31 19.9	4.553	16	18 14 1.26	2.1898	18 19 28.1	+0.038
17	16 29 40.91	2.2419	16 35 50.2	4.458	17	18 16 12.60	2.1882	18 19 23.0	0.132
18	16 31 55.41	2.2413	16 40 14.8	4.363	18	18 18 23.84	2.1865	18 19 12.3	0.225
19	16 34 9.87	2.2406	16 44 33.8	4.269	19	18 20 34.98	2.1848	18 18 56.0	0.318
20	16 36 24.28	2.2399	16 48 47.1	4.173	20	18 22 46.02	2.1831	18 18 34.1	0.411
21	16 38 38.66	2.2393	16 52 54.6	4.078	21	18 24 56.95	2.1813	18 18 6.7	0.503
22	16 40 53.00	2.2386	16 56 56.4	3.982	22	18 27 7.77	2.1795	18 17 33.7	0.596
23	16 43 7.29	2.2378	17 0 52.5	3.887	23	18 29 18.49	2.1777	18 16 55.2	0.688
24	16 45 21.54	2.2371	S. 17 4 42.8	3.791	24	18 31 29.09	2.1758	S. 18 16 11.2	0.779

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 21.					TUESDAY 23.				
	<small>h m s</small>	<small>s</small>	<small>° ' "</small>	<small>"</small>		<small>h m s</small>	<small>s</small>	<small>° ' "</small>	<small>"</small>
0	18 31 29.09	2.1758	S. 18 16 11.2	0.779	0	20 13 27.67	2.0678	S. 15 59 38.2	4.752
1	18 33 39.59	2.1740	18 15 21.7	0.871	1	20 15 31.66	2.0653	15 54 50.9	4.824
2	18 35 49.97	2.1721	18 14 26.7	0.962	2	20 17 35.50	2.0628	15 49 59.3	4.895
3	18 38 0.24	2.1703	18 13 26.3	1.053	3	20 19 39.19	2.0603	15 45 3.5	4.966
4	18 40 10.40	2.1683	18 12 20.4	1.144	4	20 21 42.73	2.0577	15 40 3.4	5.036
5	18 42 20.44	2.1663	18 11 9.0	1.234	5	20 23 46.11	2.0552	15 34 59.2	5.105
6	18 44 30.36	2.1644	18 9 52.3	1.323	6	20 25 49.35	2.0527	15 29 50.8	5.175
7	18 46 40.17	2.1624	18 8 30.2	1.413	7	20 27 52.44	2.0502	15 24 38.2	5.243
8	18 48 49.85	2.1604	18 7 2.7	1.503	8	20 29 55.37	2.0476	15 19 21.6	5.311
9	18 50 59.42	2.1585	18 5 29.8	1.593	9	20 31 58.15	2.0452	15 14 0.9	5.379
10	18 53 8.87	2.1564	18 3 51.6	1.681	10	20 34 0.79	2.0427	15 8 36.1	5.447
11	18 55 18.19	2.1543	18 2 8.1	1.769	11	20 36 3.27	2.0401	15 3 7.3	5.513
12	18 57 27.38	2.1522	18 0 19.3	1.857	12	20 38 5.60	2.0376	14 57 34.6	5.578
13	18 59 36.45	2.1501	17 58 25.2	1.945	13	20 40 7.78	2.0351	14 51 57.9	5.643
14	19 1 45.39	2.1480	17 56 25.9	2.032	14	20 42 9.81	2.0327	14 46 17.4	5.708
15	19 3 54.21	2.1459	17 54 21.4	2.119	15	20 44 11.70	2.0302	14 40 33.0	5.773
16	19 6 2.90	2.1438	17 52 11.6	2.206	16	20 46 13.43	2.0276	14 34 44.7	5.837
17	19 8 11.46	2.1416	17 49 56.7	2.292	17	20 48 15.01	2.0251	14 28 52.6	5.899
18	19 10 19.89	2.1393	17 47 36.6	2.378	18	20 50 16.44	2.0227	14 22 56.8	5.962
19	19 12 28.18	2.1371	17 45 11.4	2.463	19	20 52 17.73	2.0203	14 16 57.2	6.024
20	19 14 36.34	2.1349	17 42 41.1	2.548	20	20 54 18.87	2.0178	14 10 53.9	6.085
21	19 16 44.37	2.1327	17 40 5.7	2.633	21	20 56 19.86	2.0153	14 4 47.0	6.146
22	19 18 52.27	2.1304	17 37 25.2	2.718	22	20 58 20.70	2.0128	13 58 36.4	6.207
23	19 21 0.02	2.1281	S. 17 34 39.6	2.801	23	21 0 21.40	2.0104	S. 13 52 22.2	6.266
MONDAY 22.					WEDNESDAY 24.				
0	19 23 7.64	2.1258	S. 17 31 49.1	2.884	0	21 2 21.95	2.0080	S. 13 46 4.5	6.325
1	19 25 15.12	2.1236	17 28 53.5	2.968	1	21 4 22.36	2.0056	13 39 43.2	6.384
2	19 27 22.47	2.1213	17 25 53.0	3.050	2	21 6 22.62	2.0031	13 33 18.4	6.443
3	19 29 29.68	2.1189	17 22 47.5	3.133	3	21 8 22.73	2.0007	13 26 50.1	6.500
4	19 31 36.74	2.1166	17 19 37.1	3.214	4	21 10 22.70	1.9983	13 20 18.4	6.557
5	19 33 43.67	2.1142	17 16 21.8	3.296	5	21 12 22.53	1.9960	13 13 43.3	6.613
6	19 35 50.45	2.1118	17 13 1.6	3.377	6	21 14 22.22	1.9937	13 7 4.8	6.669
7	19 37 57.09	2.1095	17 9 36.6	3.457	7	21 16 21.77	1.9913	13 0 23.0	6.724
8	19 40 3.59	2.1071	17 6 6.8	3.537	8	21 18 21.17	1.9888	12 53 37.9	6.778
9	19 42 9.94	2.1047	17 2 32.2	3.616	9	21 20 20.43	1.9865	12 46 49.6	6.833
10	19 44 16.15	2.1023	16 58 52.9	3.695	10	21 22 19.55	1.9842	12 39 58.0	6.886
11	19 46 22.22	2.0999	16 55 8.8	3.774	11	21 24 18.54	1.9819	12 33 3.3	6.938
12	19 48 28.14	2.0974	16 51 20.0	3.852	12	21 26 17.38	1.9796	12 26 5.4	6.991
13	19 50 33.91	2.0950	16 47 26.5	3.930	13	21 28 16.09	1.9773	12 19 4.4	7.043
14	19 52 39.54	2.0926	16 43 28.4	4.007	14	21 30 14.66	1.9751	12 12 0.3	7.094
15	19 54 45.02	2.0901	16 39 25.7	4.083	15	21 32 13.10	1.9728	12 4 53.1	7.145
16	19 56 50.35	2.0877	16 35 18.4	4.160	16	21 34 11.40	1.9706	11 57 42.9	7.194
17	19 58 55.54	2.0852	16 31 6.5	4.236	17	21 36 9.57	1.9684	11 50 29.8	7.243
18	20 1 0.57	2.0827	16 26 50.1	4.311	18	21 38 7.61	1.9662	11 43 13.7	7.292
19	20 3 5.46	2.0803	16 22 29.2	4.386	19	21 40 5.52	1.9640	11 35 54.7	7.341
20	20 5 10.20	2.0778	16 18 3.8	4.460	20	21 42 3.29	1.9618	11 28 32.8	7.388
21	20 7 14.79	2.0753	16 13 34.0	4.534	21	21 44 0.94	1.9597	11 21 8.1	7.436
22	20 9 19.23	2.0728	16 8 59.7	4.607	22	21 45 58.46	1.9576	11 13 40.5	7.482
23	20 11 23.53	2.0703	16 4 21.1	4.679	23	21 47 55.85	1.9554	11 6 10.2	7.528
24	20 13 27.67	2.0678	S. 15 59 38.2	4.752	24	21 49 53.12	1.9534	S. 10 58 37.2	7.573

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 25.					SATURDAY 27.				
0	21 49 53.12	1.9534	S. 10 58 37.2	7.573	0	23 21 42.60	1.8833	S. 4 14 5.9	9.058
1	21 51 50.26	1.9513	10 51 1.5	7.618	1	23 23 35.58	1.8827	4 5 1.9	9.075
2	21 53 47.28	1.9493	10 43 23.1	7.663	2	23 25 28.52	1.8820	3 55 56.9	9.091
3	21 55 44.18	1.9473	10 35 42.0	7.706	3	23 27 21.42	1.8814	3 46 51.0	9.106
4	21 57 40.96	1.9453	10 27 58.4	7.748	4	23 29 14.29	1.8808	3 37 44.2	9.121
5	21 59 37.62	1.9433	10 20 12.2	7.791	5	23 31 7.12	1.8802	3 28 36.5	9.136
6	22 1 34.16	1.9413	10 12 23.5	7.833	6	23 32 59.91	1.8796	3 19 27.9	9.150
7	22 3 30.58	1.9394	10 4 32.3	7.874	7	23 34 52.67	1.8792	3 10 18.5	9.163
8	22 5 26.89	1.9376	9 56 38.6	7.915	8	23 36 45.41	1.8788	3 1 8.3	9.176
9	22 7 23.09	1.9357	9 48 42.5	7.954	9	23 38 38.12	1.8783	2 51 57.4	9.188
10	22 9 19.17	1.9338	9 40 44.1	7.993	10	23 40 30.80	1.8778	2 42 45.8	9.199
11	22 11 15.14	1.9319	9 32 43.3	8.032	11	23 42 23.46	1.8775	2 33 33.5	9.210
12	22 13 11.00	1.9301	9 24 40.2	8.071	12	23 44 16.10	1.8772	2 24 20.6	9.221
13	22 15 6.75	1.9283	9 16 34.8	8.108	13	23 46 8.72	1.8769	2 15 7.0	9.231
14	22 17 2.40	1.9266	9 8 27.2	8.145	14	23 48 1.33	1.8767	2 5 52.9	9.239
15	22 18 57.94	1.9248	9 0 17.4	8.182	15	23 49 53.92	1.8764	1 56 38.3	9.248
16	22 20 53.38	1.9231	8 52 5.4	8.218	16	23 51 46.50	1.8763	1 47 23.1	9.257
17	22 22 48.71	1.9213	8 43 51.2	8.253	17	23 53 39.07	1.8762	1 38 7.5	9.264
18	22 24 43.94	1.9197	8 35 35.0	8.288	18	23 55 31.64	1.8761	1 28 51.4	9.272
19	22 26 39.08	1.9182	8 27 16.7	8.322	19	23 57 24.20	1.8760	1 19 34.9	9.278
20	22 28 34.12	1.9165	8 18 56.4	8.355	20	23 59 16.76	1.8760	1 10 18.1	9.283
21	22 30 29.06	1.9149	8 10 34.1	8.388	21	0 1 9.32	1.8760	1 1 0.9	9.288
22	22 32 23.91	1.9133	8 2 9.8	8.421	22	0 3 1.88	1.8760	0 51 43.4	9.294
23	22 34 18.66	1.9118	S. 7 53 43.6	8.453	23	0 4 54.44	1.8761	S. 0 42 25.6	9.298
FRIDAY 26.					SUNDAY 28.				
0	22 36 13.32	1.9103	S. 7 45 15.5	8.483	0	0 6 47.01	1.8763	S. 0 33 7.7	9.301
1	22 38 7.89	1.9088	7 36 45.6	8.514	1	0 8 39.59	1.8764	0 23 49.5	9.304
2	22 40 2.38	1.9074	7 28 13.8	8.544	2	0 10 32.18	1.8767	0 14 31.2	9.307
3	22 41 56.78	1.9060	7 19 40.3	8.573	3	0 12 24.79	1.8769	S. 0 5 12.7	9.309
4	22 43 51.10	1.9046	7 11 5.0	8.603	4	0 14 17.41	1.8772	N. 0 4 5.9	9.310
5	22 45 45.33	1.9032	7 2 28.0	8.631	5	0 16 10.05	1.8775	0 13 24.5	9.311
6	22 47 39.48	1.9019	6 53 49.3	8.658	6	0 18 2.71	1.8778	0 22 43.2	9.312
7	22 49 33.56	1.9007	6 45 9.0	8.685	7	0 19 55.39	1.8783	0 32 1.9	9.311
8	22 51 27.56	1.8993	6 36 27.1	8.712	8	0 21 48.10	1.8787	0 41 20.5	9.310
9	22 53 21.48	1.8981	6 27 43.6	8.738	9	0 23 40.83	1.8792	0 50 39.1	9.308
10	22 55 15.33	1.8969	6 18 58.5	8.763	10	0 25 33.60	1.8797	0 59 57.5	9.306
11	22 57 9.11	1.8958	6 10 12.0	8.788	11	0 27 26.39	1.8802	1 9 15.8	9.303
12	22 59 2.82	1.8946	6 1 24.0	8.812	12	0 29 19.22	1.8808	1 18 33.9	9.300
13	23 0 56.46	1.8935	5 52 34.6	8.836	13	0 31 12.09	1.8814	1 27 51.8	9.297
14	23 2 50.04	1.8924	5 43 43.7	8.859	14	0 33 4.99	1.8821	1 37 9.5	9.293
15	23 4 43.55	1.8913	5 34 51.5	8.881	15	0 34 57.94	1.8828	1 46 26.9	9.288
16	23 6 37.00	1.8903	5 25 58.0	8.903	16	0 36 50.93	1.8836	1 55 44.0	9.282
17	23 8 30.39	1.8893	5 17 3.2	8.924	17	0 38 43.97	1.8844	2 5 0.7	9.276
18	23 10 23.72	1.8884	5 8 7.1	8.945	18	0 40 37.06	1.8853	2 14 17.1	9.270
19	23 12 17.00	1.8875	4 59 9.8	8.965	19	0 42 30.20	1.8862	2 23 33.1	9.263
20	23 14 10.22	1.8866	4 50 11.3	8.985	20	0 44 23.40	1.8871	2 32 48.6	9.255
21	23 16 3.39	1.8858	4 41 11.6	9.004	21	0 46 16.65	1.8880	2 42 3.7	9.247
22	23 17 56.51	1.8849	4 32 10.8	9.023	22	0 48 9.96	1.8890	2 51 18.2	9.238
23	23 19 49.58	1.8841	4 23 8.9	9.041	23	0 50 3.33	1.8901	3 0 32.2	9.228
24	23 21 42.60	1.8833	S. 4 14 5.9	9.058	24	0 51 56.77	1.8912	N. 3 9 45.5	9.218

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 29.					WEDNESDAY 31.				
0	0 51 56.77	1.8912	N. 3 9 45.5	9.218	0	2 24 44.19	1.9905	N. 10 9 24.8	8.033
1	0 53 50.27	1.8923	3 18 58.3	9.208	1	2 26 43.71	1.9935	10 17 25.6	7.993
2	0 55 43.84	1.8934	3 28 10.4	9.196	2	2 28 43.41	1.9966	10 25 24.0	7.953
3	0 57 37.48	1.8946	3 37 21.8	9.184	3	2 30 43.30	1.9997	10 33 20.0	7.912
4	0 59 31.19	1.8958	3 46 32.5	9.172	4	2 32 43.38	2.0028	10 41 13.5	7.870
5	1 1 24.98	1.8972	3 55 42.5	9.159	5	2 34 43.64	2.0059	10 49 4.4	7.827
6	1 3 18.85	1.8985	4 4 51.6	9.145	6	2 36 44.09	2.0092	10 56 52.8	7.784
7	1 5 12.80	1.8998	4 13 59.9	9.132	7	2 38 44.74	2.0125	11 4 38.5	7.740
8	1 7 6.83	1.9013	4 23 7.4	9.118	8	2 40 45.59	2.0158	11 12 21.6	7.696
9	1 9 0.95	1.9027	4 32 14.0	9.102	9	2 42 46.63	2.0190	11 20 2.0	7.650
10	1 10 55.15	1.9042	4 41 19.6	9.085	10	2 44 47.87	2.0223	11 27 39.6	7.604
11	1 12 49.45	1.9058	4 50 24.2	9.068	11	2 46 49.31	2.0258	11 35 14.5	7.557
12	1 14 43.84	1.9073	4 59 27.8	9.052	12	2 48 50.96	2.0292	11 42 46.5	7.510
13	1 16 38.32	1.9089	5 8 30.4	9.034	13	2 50 52.81	2.0326	11 50 15.7	7.462
14	1 18 32.91	1.9106	5 17 31.9	9.016	14	2 52 54.87	2.0361	11 57 41.9	7.413
15	1 20 27.59	1.9122	5 26 32.3	8.997	15	2 54 57.14	2.0396	12 5 5.2	7.364
16	1 22 22.37	1.9139	5 35 31.6	8.978	16	2 56 59.62	2.0431	12 12 25.6	7.314
17	1 24 17.26	1.9158	5 44 29.7	8.958	17	2 59 2.31	2.0467	12 19 42.9	7.263
18	1 26 12.26	1.9176	5 53 26.6	8.937	18	3 1 5.22	2.0503	12 26 57.1	7.211
19	1 28 7.37	1.9194	6 2 22.2	8.916	19	3 3 8.34	2.0539	12 34 8.2	7.159
20	1 30 2.59	1.9213	6 11 16.5	8.894	20	3 5 11.69	2.0576	12 41 16.2	7.107
21	1 31 57.93	1.9232	6 20 9.5	8.872	21	3 7 15.25	2.0613	12 48 21.0	7.053
22	1 33 53.38	1.9252	6 29 1.2	8.849	22	3 9 19.04	2.0650	12 55 22.5	6.998
23	1 35 48.95	1.9272	N. 6 37 51.4	8.825	23	3 11 23.05	2.0687	N. 13 2 20.7	6.943
TUESDAY 30.					THURSDAY, SEPTEMBER 1.				
0	1 37 44.65	1.9293	N. 6 46 40.2	8.801	0	3 13 27.28	2.0725	N. 13 9 15.6	6.887
1	1 39 40.47	1.9314	6 55 27.5	8.776	PHASES OF THE MOON.				
2	1 41 36.42	1.9335	7 4 13.3	8.751					
3	1 43 32.49	1.9357	7 12 57.6	8.725					
4	1 45 28.70	1.9379	7 21 40.3	8.698					
5	1 47 25.04	1.9402	7 30 21.4	8.671					
6	1 49 21.52	1.9425	7 39 0.8	8.643					
7	1 51 18.14	1.9448	7 47 38.5	8.614					
8	1 53 14.90	1.9472	7 56 14.5	8.585					
9	1 55 11.80	1.9496	8 4 48.7	8.556					
10	1 57 8.85	1.9521	8 13 21.2	8.526					
11	1 59 6.05	1.9545	8 21 51.8	8.494	☾ Last Quarter . . . Aug.	4	2	2.8	
12	2 1 3.39	1.9570	8 30 20.5	8.463	● New Moon . . . . .	11	0	58.1	
13	2 3 0.89	1.9597	8 38 47.3	8.430	☾ First Quarter . . . . .	17	16	27.1	
14	2 4 58.55	1.9623	8 47 12.1	8.398	○ Full Moon . . . . .	25	13	2.0	
15	2 6 56.36	1.9649	8 55 35.0	8.364	PHASES OF THE MOON.				
16	2 8 54.34	1.9677	9 3 55.8	8.330					
17	2 10 52.48	1.9703	9 12 14.6	8.295					
18	2 12 50.78	1.9731	9 20 31.2	8.259					
19	2 14 49.25	1.9760	9 28 45.7	8.224					
20	2 16 47.90	1.9788	9 36 58.1	8.187					
21	2 18 46.71	1.9816	9 45 8.2	8.149					
22	2 20 45.69	1.9845	9 53 16.0	8.112					
23	2 22 44.85	1.9875	10 1 21.6	8.073					
24	2 24 44.19	1.9905	N. 10 9 24.8	8.033					

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
1	<i>α</i> Aquilæ	W.	68 15 47	3569	69 34 55	3556	70 54 17	3543	72 13 54	3530
	SATURN	W.	46 4 42	3046	47 33 58	3043	49 3 18	3038	50 32 44	3032
	Aldebaran	E.	64 0 22	3056	62 31 19	3052	61 2 11	3048	59 32 58	3043
	SUN	E.	124 19 13	3431	122 57 32	3428	121 35 47	3423	120 13 57	3417
2	<i>α</i> Aquilæ	W.	78 55 24	3470	80 16 22	3459	81 37 32	3447	82 58 55	3437
	SATURN	W.	58 1 40	3001	59 31 52	2994	61 2 12	2985	62 32 43	2977
	Fomalhaut	W.	46 32 55	3705	47 49 37	3666	49 7 0	3609	50 25 3	3595
	<i>α</i> Pegasi	W.	32 13 19	4065	33 23 55	3976	34 35 58	3867	35 49 20	3826
	Aldebaran	E.	52 5 15	3014	50 35 20	3007	49 5 16	3000	47 35 3	2992
	SUN	E.	113 23 2	3384	112 0 27	3377	110 37 44	3368	109 14 51	3358
3	<i>α</i> Aquilæ	W.	89 48 48	3386	91 11 21	3375	92 34 6	3365	93 57 2	3356
	SATURN	W.	70 8 4	2930	71 39 45	2920	73 11 38	2909	74 43 46	2897
	Fomalhaut	W.	57 4 9	3445	58 25 35	3417	59 47 32	3392	61 9 58	3367
	<i>α</i> Pegasi	W.	42 12 42	3551	43 32 10	3506	44 52 27	3466	46 13 29	3428
	Aldebaran	E.	40 1 18	2946	38 29 57	2936	36 58 24	2924	35 26 36	2913
	SUN	E.	102 17 42	3308	100 53 40	3297	99 29 25	3285	98 4 56	3272
4	<i>α</i> Aquilæ	W.	100 54 25	3310	102 18 25	3302	103 42 34	3294	105 6 52	3288
	SATURN	W.	82 28 14	2835	84 1 57	2821	85 35 58	2807	87 10 17	2792
	Fomalhaut	W.	68 9 0	3252	69 34 8	3231	70 59 41	3209	72 25 40	3187
	<i>α</i> Pegasi	W.	53 8 50	3262	54 33 46	3233	55 59 16	3204	57 25 21	3177
	Aldebaran	E.	27 43 52	2851	26 10 30	2837	24 36 50	2823	23 2 52	2809
	SUN	E.	90 58 42	3204	89 32 38	3189	88 6 16	3174	86 39 36	3158
5	SATURN	W.	95 6 43	2716	96 43 2	2700	98 19 42	2684	99 56 44	2666
	Fomalhaut	W.	79 41 48	3086	81 10 15	3068	82 39 4	3048	84 8 17	3028
	<i>α</i> Pegasi	W.	64 43 43	3048	66 12 56	3025	67 42 38	3001	69 12 50	2977
	JUPITER	W.	23 36 51	2763	25 12 7	2745	26 47 37	2726	28 23 52	2708
	<i>α</i> Arietis	W.	22 21 16	3740	23 37 21	3602	24 55 53	3483	26 16 36	3379
	SUN	E.	79 21 24	3075	77 52 44	3057	76 23 42	3039	74 54 18	3021
6	SATURN	W.	108 7 41	2580	109 47 4	2562	111 26 51	2544	113 7 3	2526
	Fomalhaut	W.	91 40 13	2938	93 11 44	2922	94 43 35	2905	96 15 48	2888
	<i>α</i> Pegasi	W.	76 51 0	2866	78 24 3	2845	79 57 33	2823	81 31 31	2803
	JUPITER	W.	36 30 25	2615	38 8 59	2596	39 47 59	2577	41 27 25	2559
	<i>α</i> Arietis	W.	33 25 20	3023	34 55 4	2970	36 25 54	2923	37 57 44	2878
	SUN	E.	67 21 31	2927	65 49 46	2907	64 17 36	2887	62 45 1	2867
7	Fomalhaut	W.	104 1 51	2815	105 35 59	2804	107 10 22	2792	108 45 0	2782
	<i>α</i> Pegasi	W.	89 27 54	2705	91 4 27	2687	92 41 25	2669	94 18 46	2652
	JUPITER	W.	49 51 9	2463	51 33 14	2444	53 15 46	2425	54 58 45	2407
	<i>α</i> Arietis	W.	45 50 12	2692	47 27 3	2660	49 4 37	2629	50 42 52	2601
	SUN	E.	54 55 43	2769	53 20 35	2749	51 45 0	2729	50 8 59	2710
8	<i>α</i> Pegasi	W.	102 31 9	2574	104 10 39	2562	105 50 26	2550	107 30 30	2539
	JUPITER	W.	63 40 18	2315	65 25 56	2297	67 12 0	2279	68 58 30	2263
	<i>α</i> Arietis	W.	59 3 35	2470	60 45 30	2448	62 27 57	2425	64 10 56	2404
	SUN	E.	42 2 28	2615	40 23 54	2597	38 44 55	2580	37 5 33	2563
13	SUN	W.	27 40 17	2335	29 25 25	2342	31 10 24	2348	32 55 13	2356

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
1	<i>α</i> Aquilæ	W.	73 33 45	3517	74 53 50	3506	76 14 7	3493	77 34 39	3481
	SATURN	W.	52 2 17	3027	53 31 56	3021	55 1 43	3015	56 31 37	3008
	Aldebaran	E.	58 3 39	3039	56 34 14	3033	55 4 42	3027	53 35 2	3021
	SUN	E.	118 52 0	3411	117 29 56	3406	116 7 46	3399	114 45 28	3392
2	<i>α</i> Aquilæ	W.	84 20 30	3426	85 42 17	3416	87 4 15	3405	88 26 26	3395
	SATURN	W.	64 3 25	2969	65 34 17	2960	67 5 20	2950	68 36 36	2940
	Fomalhaut	W.	51 43 43	3562	53 2 59	3531	54 22 49	3500	55 43 13	3471
	<i>α</i> Pegasi	W.	37 3 55	3762	38 19 37	3702	39 36 22	3648	40 54 5	3598
	Aldebaran	E.	46 4 40	2983	44 34 6	2974	43 3 22	2965	41 32 26	2956
	SUN	E.	107 51 47	3350	106 28 33	3340	105 5 8	3330	103 41 31	3319
3	<i>α</i> Aquilæ	W.	95 20 9	3346	96 43 27	3337	98 6 56	3328	99 30 35	3319
	SATURN	W.	76 16 9	2886	77 48 46	2873	79 21 39	2861	80 54 48	2848
	Fomalhaut	W.	62 32 52	3344	63 56 13	3319	65 20 2	3296	66 44 18	3274
	<i>α</i> Pegasi	W.	47 35 14	3392	48 57 40	3357	50 20 45	3324	51 44 29	3292
	Aldebaran	E.	33 54 34	2901	32 22 17	2890	30 49 45	2877	29 16 57	2864
	SUN	E.	96 40 12	3259	95 15 13	3242	93 49 59	3233	92 24 29	3219
4	<i>α</i> Aquilæ	W.	106 31 18	3281	107 55 52	3271	109 20 34	3259	110 45 22	3263
	SATURN	W.	88 44 55	2778	90 19 52	2763	91 55 8	2747	93 30 45	2732
	Fomalhaut	W.	73 52 5	3167	75 18 54	3147	76 46 7	3126	78 13 45	3105
	<i>α</i> Pegasi	W.	58 51 58	3150	60 19 7	3124	61 46 48	3098	63 15 0	3073
	Aldebaran	E.	21 28 36	2794	19 54 0	2779	18 19 5	2764	16 43 50	2749
	SUN	E.	85 12 37	3143	83 45 19	3126	82 17 41	3110	80 49 43	3092
5	SATURN	W.	101 34 9	2649	103 11 57	2632	104 50 8	2615	106 28 43	2598
	Fomalhaut	W.	85 37 55	3009	87 7 56	2992	88 38 19	2973	90 9 5	2956
	<i>α</i> Pegasi	W.	70 43 31	2954	72 14 41	2932	73 46 19	2910	75 18 25	2887
	JUPITER	W.	30 0 21	2690	31 37 14	2671	33 14 33	2653	34 52 16	2634
	<i>α</i> Arietis	W.	27 39 16	3292	29 3 37	3214	30 29 29	3143	31 56 46	3080
	SUN	E.	73 24 31	3003	71 54 22	2984	70 23 49	2965	68 52 52	2946
6	SATURN	W.	114 47 40	2508	116 28 42	2490	118 10 9	2472	119 52 2	2453
	Fomalhaut	W.	97 48 22	2873	99 21 16	2858	100 54 29	2843	102 28 1	2829
	<i>α</i> Pegasi	W.	83 5 55	2782	84 40 46	2763	86 16 3	2743	87 51 46	2724
	JUPITER	W.	43 7 17	2540	44 47 35	2520	46 28 20	2502	48 9 31	2482
	<i>α</i> Arietis	W.	39 30 31	2836	41 4 12	2797	42 38 44	2760	44 14 5	2725
	SUN	E.	61 12 0	2848	59 38 34	2828	58 4 43	2808	56 30 26	2788
7	Fomalhaut	W.	110 19 51	2772	111 54 55	2763	113 30 11	2756	115 5 36	2752
	<i>α</i> Pegasi	W.	95 56 31	2635	97 34 39	2619	99 13 8	2604	100 51 58	2588
	JUPITER	W.	56 42 10	2388	58 26 2	2369	60 10 21	2351	61 55 6	2333
	<i>α</i> Arietis	W.	52 21 46	2572	54 1 19	2546	55 41 28	2520	57 22 14	2491
	SUN	E.	48 32 32	2691	46 55 40	2671	45 18 21	2652	43 40 37	2634
8	<i>α</i> Pegasi	W.	109 10 49	2529	110 51 22	2520	112 32 8	2512	114 13 5	2505
	JUPITER	W.	70 45 24	2246	72 32 43	2230	74 20 26	2214	76 8 33	2198
	<i>α</i> Arietis	W.	65 54 25	2382	67 38 25	2363	69 22 53	2344	71 7 49	2325
	SUN	E.	35 25 47	2546	33 45 38	2530	32 5 7	2515	30 24 15	2500
13	SUN	W.	34 39 51	2364	36 24 17	2374	38 8 29	2384	39 52 27	2394

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
13	Antares	E.	80 30 48	2094	78 39 40	2105	76 48 45	2112	74 58 4	2122
14	SUN	W.	41 36 10	2406	43 19 36	2418	45 2 46	2430	46 45 38	2443
	Antares	E.	65 48 46	2182	63 59 51	2196	62 11 18	2211	60 23 6	2227
	α Aquilæ	E.	113 9 1	2627	111 30 43	2626	109 52 24	2627	108 14 6	2630
15	SUN	W.	55 15 6	2515	56 55 58	2530	58 36 29	2546	60 16 38	2561
	Antares	E.	51 28 21	2316	49 42 45	2337	47 57 40	2359	46 13 6	2381
	α Aquilæ	E.	100 4 3	2663	98 26 33	2673	96 49 17	2684	95 12 16	2696
16	SUN	W.	68 31 50	2645	70 9 44	2663	71 47 14	2679	73 24 22	2695
	α Aquilæ	E.	87 11 48	2774	85 36 46	2792	84 2 8	2811	82 27 54	2831
	SATURN	E.	105 37 39	2321	103 52 10	2336	102 7 3	2352	100 22 20	2368
17	SUN	W.	81 24 21	2782	82 59 13	2799	84 33 42	2816	86 7 49	2832
	Spica	W.	23 51 39	2556	25 31 35	2561	27 11 23	2568	28 51 2	2576
	α Aquilæ	E.	74 43 25	2940	73 11 57	2965	71 41 1	2991	70 10 37	3017
	SATURN	E.	91 44 27	2448	90 2 0	2464	88 19 56	2479	86 38 13	2494
	Fomalhaut	E.	107 27 14	2838	105 53 36	2848	104 20 10	2859	102 46 58	2869
18	SUN	W.	93 53 7	2914	95 25 8	2930	96 56 49	2945	98 28 11	2961
	Spica	W.	37 6 10	2628	38 44 27	2640	40 22 28	2651	42 0 14	2663
	α Aquilæ	E.	62 47 7	3164	61 20 15	3198	59 54 3	3233	58 28 33	3270
	SATURN	E.	78 15 4	2571	76 35 29	2586	74 56 15	2601	73 17 21	2615
	Fomalhaut	E.	95 4 38	2930	93 32 57	2944	92 1 34	2958	90 30 28	2972
	α Pegasi	E.	109 57 12	2877	108 24 24	2887	106 51 49	2897	105 19 27	2907
19	SUN	W.	106 0 13	3034	107 29 43	3048	108 58 56	3062	110 27 52	3075
	Spica	W.	50 5 0	2723	51 41 9	2735	53 17 2	2746	54 52 41	2758
	α Aquilæ	E.	51 32 25	3484	50 11 43	3535	48 51 57	3588	47 33 10	3648
	SATURN	E.	65 7 37	2684	63 30 36	2697	61 53 52	2710	60 17 26	2723
	Fomalhaut	E.	82 59 32	3047	81 30 17	3063	80 1 22	3079	78 32 46	3096
	α Pegasi	E.	97 40 49	2960	96 9 46	2972	94 38 59	2983	93 8 25	2994
20	SUN	W.	117 48 32	3138	119 15 55	3151	120 43 3	3162	122 9 58	3173
	Spica	W.	62 47 10	2812	64 21 21	2823	65 55 19	2833	67 29 4	2843
	SATURN	E.	52 19 25	2784	50 44 36	2796	49 10 3	2808	47 35 45	2818
	Fomalhaut	E.	71 14 59	3183	69 48 30	3202	68 22 23	3221	66 56 39	3242
	α Pegasi	E.	85 39 16	3055	84 10 11	3068	82 41 22	3079	81 12 47	3092
21	Spica	W.	75 14 42	2889	76 47 15	2898	78 19 36	2906	79 51 47	2915
	Antares	W.	30 33 36	3115	32 1 27	3104	33 29 32	3095	34 57 48	3088
	SATURN	E.	39 47 47	2873	38 14 53	2883	36 42 13	2894	35 9 47	2905
	Fomalhaut	E.	59 54 8	3352	58 30 57	3377	57 8 14	3403	55 46 1	3431
	α Pegasi	E.	73 53 49	3158	72 26 49	3172	71 0 6	3186	69 33 40	3200
	JUPITER	E.	112 44 55	2874	111 12 3	2882	109 39 21	2891	108 6 50	2899
	α Arietis	E.	117 16 5	3033	115 46 33	3038	114 17 7	3043	112 47 47	3047
22	Spica	W.	87 30 10	2952	89 1 23	2959	90 32 27	2965	92 3 23	2973
	Antares	W.	42 20 38	3073	43 49 20	3073	45 18 3	3073	46 46 46	3074
	Fomalhaut	E.	49 3 18	3395	47 44 38	3635	46 26 41	3677	45 9 29	3724
	α Pegasi	E.	62 25 54	3277	61 1 16	3295	59 36 59	3313	58 13 3	3332



## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV <sup>h</sup>	P. L. of Diff.	XVIII <sup>h</sup>	P. L. of Diff.	XXI <sup>h</sup>	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
13	Antares	E.	73 7 39	2132	71 17 29	2143	69 27 36	2156	67 38 1	2169
14	SUN	W.	48 28 11	2457	50 10 25	2471	51 52 19	2485	53 33 53	2500
	Antares	E.	58 35 18	2243	56 47 54	2261	55 0 56	2279	53 14 25	2297
	α Aquilæ	E.	106 35 52	2634	104 57 43	2639	103 19 40	2645	101 41 46	2653
15	SUN	W.	61 56 26	2578	63 35 51	2595	65 14 53	2611	66 53 33	2628
	Antares	E.	44 29 4	2405	42 45 36	2429	41 2 43	2455	39 20 27	2484
	α Aquilæ	E.	93 35 31	2710	91 59 5	2725	90 22 59	2741	88 47 13	2756
16	SUN	W.	75 1 8	2713	76 37 30	2731	78 13 29	2747	79 49 6	2764
	α Aquilæ	E.	80 54 6	2851	79 20 44	2872	77 47 49	2894	76 15 23	2916
	SATURN	E.	98 38 0	2384	96 54 3	2400	95 10 28	2416	93 27 16	2432
17	SUN	W.	87 41 36	2849	89 15 0	2866	90 48 3	2882	92 20 45	2898
	Spica	W.	30 30 31	2585	32 9 47	2595	33 48 50	2606	35 27 38	2617
	α Aquilæ	E.	68 40 45	3044	67 11 27	3073	65 42 44	3102	64 14 37	3133
	SATURN	E.	84 56 52	2510	83 15 53	2526	81 35 16	2541	79 55 0	2556
	Fomalhaut	E.	101 14 0	2881	99 41 17	2892	98 8 48	2905	96 36 35	2917
18	SUN	W.	99 59 13	2976	101 29 56	2991	103 0 19	3005	104 30 25	3020
	Spica	W.	43 37 44	2675	45 14 57	2687	46 51 54	2699	48 28 35	2711
	α Aquilæ	E.	57 3 46	3308	55 39 44	3348	54 16 28	3391	52 54 1	3436
	SATURN	E.	71 38 46	2629	70 0 31	2643	68 22 34	2657	66 44 56	2671
	Fomalhaut	E.	88 59 40	2986	87 29 10	3001	85 58 58	3016	84 29 5	3032
	α Pegasi	E.	103 47 17	2917	102 15 20	2928	100 43 36	2939	99 12 6	2949
19	SUN	W.	111 56 32	3089	113 24 55	3101	114 53 3	3114	116 20 55	3127
	Spica	W.	56 28 4	2769	58 3 12	2781	59 38 5	2791	61 12 44	2801
	α Aquilæ	E.	46 15 27	3710	44 58 51	3777	43 43 25	3851	42 29 15	3930
	SATURN	E.	58 41 17	2736	57 5 25	2748	55 29 49	2760	53 54 29	2772
	Fomalhaut	E.	77 4 31	3112	75 36 36	3130	74 9 3	3147	72 41 50	3165
	α Pegasi	E.	91 38 5	3007	90 8 1	3018	88 38 11	3030	87 8 36	3043
20	SUN	W.	123 36 39	3184	125 3 7	3195	126 29 22	3205	127 55 25	3214
	Spica	W.	69 2 36	2852	70 35 56	2862	72 9 3	2871	73 41 58	2880
	SATURN	E.	46 1 41	2829	44 27 51	2841	42 54 16	2852	41 20 55	2862
	Fomalhaut	E.	65 31 19	3262	64 6 23	3284	62 41 52	3306	61 17 47	3328
	α Pegasi	E.	79 44 28	3105	78 16 25	3118	76 48 37	3131	75 21 5	3144
21	Spica	W.	81 23 47	2923	82 55 37	2931	84 27 17	2938	85 58 48	2945
	Antares	W.	36 26 12	3083	37 54 42	3079	39 23 18	3076	40 51 57	3074
	SATURN	E.	33 37 35	2916	32 5 37	2927	30 33 52	2939	29 2 22	2949
	Fomalhaut	E.	54 24 20	3460	53 3 11	3491	51 42 37	3523	50 22 38	3558
	α Pegasi	E.	68 7 31	3215	66 41 40	3230	65 16 6	3246	63 50 51	3261
	JUPITER	E.	106 34 30	2907	105 2 20	2914	103 30 19	2922	101 58 28	2929
	α Arietis	E.	111 18 32	3052	109 49 24	3057	108 20 22	3062	106 51 27	3067
22	Spica	W.	93 34 10	2979	95 4 49	2985	96 35 21	2991	98 5 45	2997
	Antares	W.	48 15 29	3075	49 44 10	3076	51 12 50	3077	52 41 28	3078
	Fomalhaut	E.	43 53 7	3774	42 37 38	3827	41 23 4	3887	40 9 31	3951
	α Pegasi	E.	56 49 29	3352	55 26 17	3372	54 3 28	3394	52 41 4	3417

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
22	JUPITER E.	100 26 46	2936	98 55 13	2943	97 23 49	2949	95 52 33	2955
	α Arietis E.	105 22 37	3073	103 53 54	3078	102 25 17	3082	100 56 46	3088
23	Spica W.	99 36 2	3002	101 6 12	3008	102 36 15	3013	104 6 12	3018
	Antares W.	54 10 5	3080	55 38 39	3082	57 7 10	3084	58 35 39	3086
	Fomalhaut E.	38 57 3	4023	37 45 46	4103	36 35 47	4189	35 27 11	4288
	α Pegasi E.	51 19 7	3441	49 57 37	3466	48 36 35	3494	47 16 4	3525
	JUPITER E.	88 18 4	2984	86 47 31	2989	85 17 6	2994	83 46 46	2999
	α Arietis E.	93 35 48	3114	92 7 55	3119	90 40 8	3124	89 12 27	3129
24	Spica W.	111 34 24	3042	113 3 45	3046	114 33 1	3050	116 2 12	3054
	Antares W.	65 57 24	3097	67 25 37	3099	68 53 47	3101	70 21 55	3104
	JUPITER E.	76 16 31	3020	74 46 43	3024	73 17 0	3027	71 47 21	3031
	α Arietis E.	81 55 33	3154	80 28 29	3158	79 1 30	3163	77 34 37	3168
	Aldebaran E.	114 36 13	3023	113 6 29	3026	111 36 49	3030	110 7 13	3034
25	Antares W.	77 41 52	3114	79 9 44	3116	80 37 34	3118	82 5 22	3120
	JUPITER E.	64 20 8	3046	62 50 52	3048	61 21 39	3050	59 52 28	3052
	α Arietis E.	70 21 46	3195	68 55 31	3201	67 29 23	3206	66 3 21	3212
	Aldebaran E.	102 40 16	3049	101 11 4	3052	99 41 55	3054	98 12 49	3056
26	Antares W.	89 23 48	3128	90 51 24	3129	92 18 59	3130	93 46 32	3131
	JUPITER E.	52 27 13	3061	50 58 16	3063	49 29 21	3064	48 0 27	3065
	α Arietis E.	58 54 59	3244	57 29 42	3251	56 4 33	3259	54 39 34	3267
	Aldebaran E.	90 47 54	3065	89 19 1	3066	87 50 10	3067	86 21 19	3068
27	Antares W.	101 3 59	3135	102 31 26	3136	103 58 51	3136	105 26 17	3137
	α Aquilæ W.	55 14 57	3745	56 30 57	3721	57 47 22	3699	59 4 10	3679
	JUPITER E.	40 36 11	3068	39 7 22	3067	37 38 32	3067	36 9 42	3067
	α Arietis E.	47 37 11	3317	46 13 19	3329	44 49 41	3343	43 26 19	3357
	Aldebaran E.	78 57 21	3069	77 28 34	3069	75 59 47	3069	74 30 59	3068
28	α Aquilæ W.	65 33 2	3597	66 51 40	3584	68 10 32	3571	69 29 38	3558
	JUPITER E.	28 45 27	3064	27 16 33	3063	25 47 38	3063	24 18 43	3063
	Aldebaran E.	67 6 44	3062	65 37 48	3060	64 8 50	3058	62 39 49	3056
	Pollux E.	110 33 18	3155	109 6 15	3151	107 39 7	3147	106 11 55	3143
29	α Aquilæ W.	76 8 21	3506	77 28 39	3496	78 49 8	3487	80 9 47	3478
	SATURN W.	56 51 49	3030	58 21 25	3025	59 51 7	3020	61 20 54	3015
	Aldebaran E.	55 13 52	3039	53 44 28	3036	52 15 0	3032	50 45 26	3027
	Pollux E.	98 54 42	3124	97 27 1	3119	95 59 14	3114	94 31 21	3109
30	α Aquilæ W.	86 55 23	3438	88 16 56	3431	89 38 37	3424	91 0 26	3418
	SATURN W.	68 51 29	2987	70 21 58	2981	71 52 35	2974	73 23 20	2966
	Aldebaran E.	43 16 4	2999	41 45 50	2993	40 15 29	2986	38 44 59	2980
	Pollux E.	87 10 22	3081	85 41 50	3075	84 13 10	3069	82 44 23	3063
	SUN E.	131 27 32	3361	130 4 34	3357	128 41 28	3349	127 18 13	3341
31	α Aquilæ W.	97 51 17	3388	99 13 47	3382	100 36 24	3378	101 59 6	3373
	SATURN W.	80 59 32	2986	82 31 16	2916	84 3 16	2907	85 35 26	2897
	Pollux E.	75 18 21	3027	73 48 42	3019	72 18 53	3011	70 48 54	3003
	SUN E.	120 19 38	3297	118 55 23	3287	117 30 57	3277	116 6 19	3266

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
22	JUPITER E. α Arietis E.	94 21 24 99 28 22	2962 3093	92 50 23 98 0 4	2968 3099	91 19 30 96 31 53	2973 3104	89 48 43 95 3 47	2979 3109
23	Spica W. Antares W. Fomalhaut E. α Pegasi E. JUPITER E. α Arietis E.	105 36 3 60 4 6 34 20 7 45 56 8 82 16 32 87 44 52	3023 3088 4397 3557 3004 3134	107 5 47 61 32 30 33 14 43 44 36 47 80 46 24 86 17 24	3028 3091 4519 3591 3008 3138	108 35 25 63 0 50 32 11 8 43 18 3 79 16 21 84 50 1	3033 3093 4657 3628 3012 3143	110 4 57 64 29 8 31 9 32 41 59 59 77 46 24 83 22 44	3037 3095 4815 3670 3016 3148
24	Spica W. Antares W. JUPITER E. α Arietis E. Aldebaran E.	117 31 17 71 50 0 70 17 47 76 7 50 108 37 42	3058 3106 3034 3174 3037	119 0 18 73 18 2 68 48 17 74 41 10 107 8 15	3062 3108 3037 3179 3040	120 29 14 74 46 1 67 18 51 73 14 36 105 38 52	3066 3110 3040 3184 3043	121 58 5 76 13 58 65 49 28 71 48 8 104 9 32	3069 3112 3043 3189 3046
25	Antares W. JUPITER E. α Arietis E. Aldebaran E.	83 33 7 58 23 20 64 37 26 96 43 45	3122 3055 3218 3058	85 0 50 56 54 15 63 11 38 95 14 44	3124 3056 3224 3060	86 28 31 55 25 12 61 45 57 93 45 46	3125 3058 3231 3061	87 56 10 53 56 12 60 20 24 92 16 49	3126 3060 3237 3063
26	Antares W. JUPITER E. α Arietis E. Aldebaran E.	95 14 4 46 31 34 53 14 44 84 52 30	3132 3065 3276 3069	96 41 34 45 2 42 51 50 4 83 23 42	3133 3066 3285 3069	98 9 3 43 33 51 50 25 34 81 54 55	3134 3067 3295 3069	99 36 31 42 5 1 49 1 16 80 26 8	3134 3067 3306 3069
27	Antares W. α Aquilæ W. JUPITER E. α Arietis E. Aldebaran E.	106 53 42 60 21 19 34 40 52 42 3 13 73 2 11	3138 3661 3067 3373 3067	108 21 6 61 38 48 33 12 2 40 40 26 71 33 21	3138 3644 3066 3392 3066	109 48 30 62 56 35 31 43 11 39 18 0 70 4 31	3138 3627 3066 3412 3065	111 15 54 64 14 40 30 14 20 37 55 57 68 35 38	3138 3611 3065 3418 3064
28	α Aquilæ W. JUPITER E. Aldebaran E. Pollux E.	70 48 58 22 49 48 61 10 45 104 44 38	3546 3061 3053 3139	72 8 31 21 20 51 59 41 38 103 17 16	3535 3061 3050 3135	73 28 16 19 51 54 58 12 27 101 49 50	3525 3061 3047 3131	74 48 13 18 22 57 56 43 12 100 22 18	3515 3062 3043 3128
29	α Aquilæ W. SATURN W. Aldebaran E. Pollux E.	81 30 36 62 50 48 49 15 47 93 3 22	3470 3010 3022 3104	82 51 34 64 20 48 47 46 1 91 35 17	3461 3005 3017 3099	84 12 42 65 50 54 46 16 9 90 7 6	3454 2959 3011 3093	85 33 58 67 21 8 44 46 10 88 38 48	3446 2993 3005 3087
30	α Aquilæ W. SATURN W. Aldebaran E. Pollux E. SUN E.	92 22 22 74 54 15 37 14 21 81 15 28 125 54 50	3411 2959 2972 3056 3333	93 44 26 76 25 19 35 43 33 79 46 24 124 31 17	3406 2951 2964 3049 3325	95 6 36 77 56 33 34 12 36 78 17 12 123 7 35	3400 2943 2956 3042 3316	96 28 53 79 27 57 32 41 28 76 47 51 121 43 42	3393 2935 2947 3034 3306
31	α Aquilæ W. SATURN W. Pollux E. SUN E.	103 21 53 87 7 48 69 18 45 114 41 28	3369 2887 2995 3255	104 44 45 88 40 23 67 48 26 113 16 24	3365 2877 2986 3244	106 7 41 90 13 11 66 17 56 111 51 7	3362 2866 2977 3232	107 30 41 91 46 13 64 47 15 110 25 35	3358 2855 2969 3220

## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ' "	"	' "	s	m s	s
Thur.	1	10 40 51.42	9.071	N. 8 21 10.4	- 54.36	15 53.05	64.38	0 1.13	0.782
Frid.	2	10 44 29.00	9.060	7 59 21.6	54.70	15 53.28	64.34	0 20.06	0.794
Sat.	3	10 48 6.31	9.050	7 37 25.0	55.02	15 53.51	64.30	0 39.25	0.805
SUN.	4	10 51 43.38	9.040	7 15 20.8	- 55.32	15 53.74	64.26	0 58.69	0.815
Mon.	5	10 55 20.20	9.031	6 53 9.5	55.61	15 53.97	64.22	1 18.35	0.824
Tues.	6	10 58 56.82	9.022	6 30 51.4	55.89	15 54.21	64.18	1 38.24	0.832
Wed.	7	11 2 33.24	9.014	6 8 26.7	- 56.16	15 54.45	64.15	1 58.31	0.840
Thur.	8	11 6 9.48	9.006	5 45 55.9	56.41	15 54.69	64.12	2 18.57	0.848
Frid.	9	11 9 45.55	9.000	5 23 19.2	56.64	15 54.93	64.10	2 39.00	0.854
Sat.	10	11 13 21.47	8.994	5 0 37.1	- 56.86	15 55.18	64.08	2 59.57	0.860
SUN.	11	11 16 57.25	8.988	4 37 49.9	57.07	15 55.43	64.06	3 20.29	0.866
Mon.	12	11 20 32.90	8.983	4 14 57.9	57.26	15 55.69	64.05	3 41.14	0.871
Tues.	13	11 24 8.43	8.979	3 52 1.5	- 57.44	15 55.95	64.04	4 2.09	0.875
Wed.	14	11 27 43.88	8.975	3 29 1.0	57.60	15 56.21	64.03	4 23.15	0.879
Thur.	15	11 31 19.24	8.972	3 5 56.7	57.75	15 56.48	64.02	4 44.27	0.882
Frid.	16	11 34 54.55	8.970	2 42 49.1	- 57.88	15 56.75	64.01	5 5.47	0.884
Sat.	17	11 38 29.82	8.969	2 19 38.4	58.00	15 57.01	64.01	5 26.69	0.885
SUN.	18	11 42 5.06	8.969	1 56 25.0	58.11	15 57.28	64.01	5 47.93	0.885
Mon.	19	11 45 40.32	8.970	1 33 9.2	- 58.20	15 57.55	64.02	6 9.17	0.884
Tues.	20	11 49 15.60	8.971	1 9 51.3	58.28	15 57.82	64.03	6 30.38	0.883
Wed.	21	11 52 50.92	8.973	0 46 31.7	58.35	15 58.09	64.04	6 51.55	0.881
Thur.	22	11 56 26.33	8.976	N. 0 23 10.6	- 58.40	15 58.37	64.05	7 12.65	0.877
Frid.	23	12 0 1.82	8.981	S. 0 0 11.6	58.44	15 58.64	64.07	7 33.64	0.872
Sat.	24	12 3 37.44	8.987	0 23 34.5	58.46	15 58.92	64.09	7 54.52	0.867
SUN.	25	12 7 13.19	8.993	0 46 57.8	- 58.47	15 59.19	64.11	8 15.26	0.861
Mon.	26	12 10 49.12	9.001	1 10 21.3	58.47	15 59.46	64.13	8 35.84	0.853
Tues.	27	12 14 25.23	9.009	1 33 44.6	58.46	15 59.73	64.16	8 56.22	0.845
Wed.	28	12 18 1.55	9.018	1 57 7.3	- 58.43	16 0.00	64.19	9 16.39	0.836
Thur.	29	12 21 38.11	9.029	2 20 29.1	58.38	16 0.27	64.23	9 36.33	0.825
Frid.	30	12 25 14.93	9.040	2 43 49.7	58.32	16 0.54	64.27	9 56.01	0.814
Sat.	31	12 28 52.04	9.052	S. 3 7 8.8	- 58.25	16 0.81	64.31	10 15.40	0.802

NOTE.—The mean time of semidiameter passing the meridian may be found by subtracting 0.18 from the sidereal time. The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing, south declinations increasing.

## AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ' "	"	m s	s	h m s
Thur.	1	10 40 51.43	9.073	N. 8 21 10.4	-54.38	0 1.13	0.783	10 40 52.56
Frid.	2	10 44 29.05	9.062	7 59 21.3	54.71	0 20.06	0.795	10 44 49.12
Sat.	3	10 48 6.41	9.051	7 37 24.4	55.03	0 39.26	0.805	10 48 45.67
SUN.	4	10 51 43.52	9.041	7 15 19.9	-55.34	0 58.70	0.815	10 52 42.22
Mon.	5	10 55 20.40	9.032	6 53 8.3	55.63	1 18.37	0.824	10 56 38.77
Tues.	6	10 58 57.07	9.024	6 30 49.8	55.91	1 38.26	0.832	11 0 35.32
Wed.	7	11 2 33.54	9.016	6 8 24.8	-56.17	1 58.34	0.840	11 4 31.88
Thur.	8	11 6 9.83	9.008	5 45 53.7	56.42	2 18.60	0.848	11 8 28.43
Frid.	9	11 9 45.95	9.002	5 23 16.7	56.66	2 39.03	0.855	11 12 24.98
Sat.	10	11 13 21.92	8.996	5 0 34.3	-56.88	2 59.61	0.861	11 16 21.53
SUN.	11	11 16 57.75	8.990	4 37 46.7	57.08	3 20.34	0.866	11 20 18.08
Mon.	12	11 20 33.45	8.985	4 14 54.4	57.27	3 41.19	0.871	11 24 14.64
Tues.	13	11 24 9.04	8.981	3 51 57.6	-57.45	4 2.15	0.875	11 28 11.19
Wed.	14	11 27 44.53	8.977	3 28 56.8	57.62	4 23.21	0.879	11 32 7.74
Thur.	15	11 31 19.95	8.974	3 5 52.2	57.76	4 44.34	0.882	11 36 4.29
Frid.	16	11 34 55.31	8.972	2 42 44.2	-57.90	5 5.54	0.884	11 40 0.84
Sat.	17	11 38 30.63	8.971	2 19 33.2	58.02	5 26.77	0.885	11 43 57.40
SUN.	18	11 42 5.93	8.971	1 56 19.4	58.12	5 48.02	0.885	11 47 53.95
Mon.	19	11 45 41.24	8.972	1 33 3.2	-58.22	6 9.26	0.885	11 51 50.50
Tues.	20	11 49 16.57	8.973	1 9 45.0	58.30	6 30.48	0.883	11 55 47.05
Wed.	21	11 52 51.95	8.976	0 46 25.0	58.36	6 51.65	0.881	11 59 43.60
Thur.	22	11 56 27.41	8.979	N. 0 23 3.6	-58.42	7 12.75	0.877	12 3 40.13
Frid.	23	12 0 2.96	8.983	S. 0 0 18.9	58.46	7 33.75	0.872	12 7 36.70
Sat.	24	12 3 38.62	8.989	0 23 42.2	58.48	7 54.63	0.867	12 11 33.26
SUN.	25	12 7 14.43	8.995	0 47 5.9	-58.49	8 15.38	0.861	12 15 29.81
Mon.	26	12 10 50.40	9.003	1 10 29.7	58.49	8 35.96	0.853	12 19 26.36
Tues.	27	12 14 26.57	9.011	1 33 53.3	58.47	8 56.34	0.845	12 23 22.91
Wed.	28	12 18 2.95	9.020	1 57 16.3	-58.44	9 16.52	0.836	12 27 19.46
Thur.	29	12 21 39.56	9.031	2 20 38.5	58.40	9 36.46	0.825	12 31 16.02
Frid.	30	12 25 16.43	9.042	2 43 59.4	58.34	9 56.14	0.814	12 35 12.57
Sat.	31	12 28 53.58	9.054	S. 3 7 18.7	-58.27	10 15.54	0.802	12 39 9.12

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.  
 The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing, south declinations increasing.

Diff. for 1 Hour,  
 +9°.8565.  
 (Table III.)

AT GREENWICH MEAN NOON.								
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		$\lambda$	$\lambda'$					
1	245	158 35 39.5	35 8.6	145.22	— 0.36	0.003 8295	— 42.5	h m s 13 16 56.52
2	246	159 33 45.8	33 14.8	145.30	0.40	0.003 7271	43.0	13 13 0.61
3	247	160 31 54.0	31 23.0	145.39	0.41	0.003 6236	43.4	13 9 4.71
4	248	161 30 4.3	29 33.2	145.47	— 0.40	0.003 5190	— 43.8	13 5 8.80
5	249	162 28 16.6	27 45.4	145.56	0.34	0.003 4131	44.4	13 1 12.89
6	250	163 26 31.0	25 59.7	145.64	0.25	0.003 3059	45.0	12 57 16.99
7	251	164 24 47.4	24 16.0	145.72	— 0.14	0.003 1972	— 45.6	12 53 21.08
8	252	165 23 5.7	22 34.2	145.80	— 0.02	0.003 0869	46.3	12 49 25.18
9	253	166 21 25.9	20 54.3	145.88	+ 0.13	0.002 9751	46.8	12 45 29.27
10	254	167 19 48.0	19 16.3	145.96	+ 0.29	0.002 8617	— 47.6	12 41 33.36
11	255	168 18 11.9	17 40.2	146.03	0.42	0.002 7467	48.2	12 37 37.46
12	256	169 16 37.5	16 5.7	146.10	0.55	0.002 6301	48.8	12 33 41.55
13	257	170 15 4.7	14 32.8	146.17	+ 0.66	0.002 5122	— 49.4	12 29 45.65
14	258	171 13 33.6	13 1.6	146.24	0.75	0.002 3931	49.9	12 25 49.74
15	259	172 12 4.1	11 32.1	146.30	0.80	0.002 2730	50.3	12 21 53.83
16	260	173 10 36.2	10 4.1	146.37	+ 0.82	0.002 1520	— 50.6	12 17 57. 3
17	261	174 9 10.0	8 37.8	146.44	0.82	0.002 0303	50.8	12 14 2.02
18	262	175 7 45.4	7 13.1	146.51	0.78	0.001 9080	51.0	12 10 6.12
19	263	176 6 22.5	5 50.1	146.58	+ 0.72	0.001 7853	— 51.2	12 6 10.21
20	264	177 5 1.3	4 28.9	146.65	0.63	0.001 6624	51.3	12 2 14.30
21	265	178 3 41.9	3 9.4	146.73	0.53	0.001 5393	51.3	11 58 18.40
22	266	179 2 24.3	1 51.7	146.80	+ 0.41	0.001 4161	— 51.3	11 54 22.49
23	267	180 1 8.6	0 35.9	146.89	0.28	0.001 2929	51.3	11 50 26.59
24	268	180 59 54.8	59 22.1	146.97	0.15	0.001 1698	51.3	11 46 30.68
25	269	181 58 43.0	58 10.2	147.05	+ 0.04	0.001 0468	— 51.2	11 42 34.78
26	270	182 57 33.3	57 0.4	147.14	— 0.07	0.000 9239	51.2	11 38 38.87
27	271	183 56 25.7	55 52.7	147.23	0.16	0.000 8012	51.1	11 34 42.96
28	272	184 55 20.2	54 47.2	147.32	— 0.24	0.000 6786	— 51.0	11 30 47.06
29	273	185 54 16.9	53 43.8	147.41	0.28	0.000 5563	51.0	11 26 51.15
30	274	186 53 15.9	52 42.6	147.50	0.31	0.000 4340	50.9	11 22 55.25
31	275	187 52 17.1	51 43.8	147.60	— 0.31	0.000 3118	— 50.9	11 18 59.34
NOTE.—The longitudes in the column $\lambda$ are referred to the true equinox of their own date, while those in the column $\lambda'$ are referred to the mean equinox of the beginning of the Besselian fictitious year.								
								Diff. for 1 Hour, — 9 <sup>s</sup> .8296. (Table II.)

GREENWICH MEAN TIME.

Day of the Month.	THE MOON'S									
	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.	
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.	
	"	"	"	"	"	"	h m	m	d	
1	15 9.4	15 14.8	55 31.5	+ 1.57	55 51.3	+ 1.73	17 5.8	2.04	21.0	
2	15 20.7	15 27.1	56 13.1	1.88	56 36.6	2.03	17 56.2	2.16	22.0	
3	15 34.0	15 41.2	57 1.8	2.15	57 28.3	2.25	18 49.3	2.27	23.0	
4	15 48.7	15 56.3	57 55.8	+ 2.31	58 23.8	+ 2.34	19 44.9	2.36	24.0	
5	16 4.0	16 11.5	58 52.0	2.32	59 19.6	2.25	20 42.3	2.41	25.0	
6	16 18.7	16 25.4	59 46.0	2.13	60 10.6	1.94	21 40.5	2.43	26.0	
7	16 31.4	16 36.5	60 32.6	+ 1.70	60 51.3	+ 1.40	22 38.7	2.41	27.0	
8	16 40.5	16 43.3	61 6.2	1.05	61 16.6	+ 0.66	23 36.2	2.38	28.0	
9	16 44.8	16 45.0	61 22.1	+ 0.25	61 22.6	-- 0.17	6		29.0	
10	16 43.7	16 41.2	61 18.0	- 0.58	61 8.6	- 0.98	0 32.7	2.34	0.6	
11	16 37.4	16 32.4	60 54.6	1.34	60 36.5	1.65	1 28.4	2.30	1.6	
12	16 26.5	16 19.9	60 14.9	1.91	59 50.6	2.11	2 23.3	2.28	2.6	
13	16 12.8	16 5.2	59 24.3	- 2.25	58 56.6	- 2.33	3 17.7	2.26	3.6	
14	15 57.5	15 49.8	58 28.3	2.34	57 59.9	2.34	4 11.5	2.23	4.6	
15	15 42.2	15 34.9	57 32.0	2.28	57 5.1	2.19	5 4.8	2.20	5.6	
16	15 27.9	15 21.4	56 39.5	- 2.07	56 15.5	- 1.93	5 57.1	2.15	6.6	
17	15 15.3	15 9.8	55 53.2	1.77	55 32.9	1.60	6 48.2	2.10	7.6	
18	15 4.8	15 0.4	55 14.7	1.43	54 58.6	1.25	7 37.7	2.03	8.6	
19	14 56.6	14 53.3	54 44.5	- 1.08	54 32.5	- 0.92	8 25.4	1.96	9.6	
20	14 50.6	14 48.4	54 22.5	0.75	54 14.4	0.60	9 11.5	1.89	10.6	
21	14 46.7	14 45.4	54 8.1	0.45	54 3.5	0.31	9 56.1	1.83	11.6	
22	14 44.6	14 44.2	54 0.6	- 0.18	53 59.1	- 0.06	10 39.5	1.79	12.6	
23	14 44.2	14 44.6	53 59.1	+ 0.05	54 0.5	+ 0.17	11 22.1	1.77	13.6	
24	14 45.3	14 46.4	54 3.2	0.28	54 7.1	0.38	12 4.6	1.77	14.6	
25	14 47.8	14 49.5	54 12.3	+ 0.48	54 18.6	+ 0.58	12 47.4	1.80	15.6	
26	14 51.6	14 54.0	54 26.2	0.68	54 35.1	0.79	13 31.0	1.84	16.6	
27	14 56.8	14 59.9	54 45.2	0.90	54 56.7	1.01	14 16.0	1.91	17.6	
28	15 3.4	15 7.3	55 9.5	+ 1.13	55 23.7	+ 1.24	15 2.8	1.99	18.6	
29	15 11.5	15 16.2	55 39.4	1.36	55 56.5	1.48	15 51.7	2.09	19.6	
30	15 21.3	15 26.7	56 15.1	1.60	56 35.1	1.72	16 42.8	2.18	20.6	
31	15 32.5	15 38.6	56 56.3	1.82	57 18.8	1.92	17 36.0	2.25	21.6	
32	15 45.0	15 51.6	57 42.3	+ 1.98	58 6.4	+ 2.03	18 30.8	2.31	22.6	

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 1.					SATURDAY 3.				
0	h m s	s	N. 13 9 15.6	6.887	0	h m s	s	N. 17 21 26.2	3.331
1	3 13 27.28	2.0725	13 16 7.1	6.830	1	4 57 39.45	2.2733	17 24 43.3	3.239
2	3 15 31.75	2.0763	13 22 55.2	6.773	2	4 59 55.98	2.2776	17 27 54.9	3.146
3	3 17 36.44	2.0801	13 29 39.9	6.716	3	5 2 12.76	2.2818	17 31 0.8	3.052
4	3 19 41.36	2.0840	13 36 21.1	6.657	4	5 4 29.80	2.2861	17 34 1.1	2.958
5	3 21 46.52	2.0879	13 42 58.7	6.597	5	5 6 47.09	2.2903	17 36 55.7	2.863
6	3 23 51.91	2.0918	13 49 32.7	6.537	6	5 9 4.63	2.2945	17 39 44.6	2.767
7	3 25 57.33	2.0957	13 56 3.1	6.476	7	5 11 22.43	2.2987	17 42 27.7	2.670
8	3 28 3.39	2.0997	14 2 29.8	6.414	8	5 13 40.48	2.3028	17 45 5.0	2.573
9	3 30 9.49	2.1037	14 8 52.8	6.352	9	5 15 58.77	2.3070	17 47 36.4	2.474
10	3 32 15.83	2.1076	14 15 12.0	6.288	10	5 18 17.32	2.3112	17 50 1.9	2.375
11	3 34 22.40	2.1116	14 21 27.4	6.224	11	5 20 36.11	2.3153	17 52 21.4	2.275
12	3 36 29.22	2.1157	14 27 38.9	6.160	12	5 22 55.15	2.3193	17 54 34.9	2.175
13	3 38 36.28	2.1198	14 33 46.6	6.095	13	5 25 14.43	2.3234	17 56 42.4	2.075
14	3 40 43.59	2.1238	14 39 50.3	6.028	14	5 27 33.96	2.3275	17 58 43.9	1.973
15	3 42 51.14	2.1279	14 45 50.0	5.962	15	5 29 53.73	2.3314	18 0 39.2	1.871
16	3 44 58.94	2.1321	14 51 45.7	5.894	16	5 32 13.73	2.3354	18 2 28.4	1.768
17	3 47 6.99	2.1362	14 57 37.3	5.826	17	5 34 33.98	2.3395	18 4 11.4	1.665
18	3 49 15.28	2.1403	15 3 24.8	5.757	18	5 36 54.47	2.3434	18 5 48.2	1.562
19	3 51 23.82	2.1445	15 9 8.1	5.687	19	5 39 15.19	2.3473	18 8 43.0	1.457
20	3 53 32.62	2.1488	15 14 47.2	5.617	20	5 41 36.14	2.3512	18 10 0.9	1.351
21	3 55 41.67	2.1529	15 20 22.1	5.545	21	5 43 57.33	2.3550	18 11 12.4	1.245
22	3 57 50.97	2.1571	15 25 52.6	5.473	22	5 46 18.74	2.3588	18 12 17.6	1.139
23	4 0 0.52	2.1613	N. 15 31 18.8	5.400	23	5 48 40.38	2.3626		
24	4 2 10.33	2.1656			24	5 51 2.25	2.3663		
FRIDAY 2.					SUNDAY 4.				
0	h m s	s	N. 15 36 40.6	5.326	0	5 53 24.34	2.3700	N. 18 13 16.2	0.923
1	4 4 30.71	2.1742	15 41 57.9	5.252	1	5 55 46.65	2.3737	18 14 8.4	0.816
2	4 6 41.29	2.1784	15 47 10.8	5.177	2	5 58 9.18	2.3773	18 14 54.1	0.707
3	4 8 52.12	2.1827	15 52 19.1	5.101	3	6 0 31.93	2.3809	18 15 33.2	0.598
4	4 10 5.21	2.1870	15 57 22.9	5.024	4	6 2 54.89	2.3844	18 16 5.8	0.488
5	4 12 14.56	2.1913	16 2 22.0	4.946	5	6 5 18.06	2.3879	18 16 31.8	0.378
6	4 14 26.17	2.1956	16 7 16.4	4.868	6	6 7 41.44	2.3914	18 16 51.2	0.268
7	4 16 38.03	2.1998	16 12 6.1	4.789	7	6 10 5.03	2.3948	18 17 3.9	0.156
8	4 18 50.15	2.2042	16 16 51.1	4.710	8	6 12 28.82	2.3983	18 17 9.9	+ 0.043
9	4 20 5.54	2.2086	16 21 31.3	4.629	9	6 14 52.82	2.4016	18 17 9.1	- 0.069
10	4 22 15.18	2.2129	16 26 6.6	4.548	10	6 17 17.01	2.4048	18 17 1.6	0.182
11	4 24 28.09	2.2173	16 30 37.0	4.466	11	6 19 41.40	2.4081	18 16 47.3	0.294
12	4 26 41.25	2.2216	16 35 2.5	4.383	12	6 22 5.98	2.4113	18 16 26.3	0.405
13	4 28 54.68	2.2259	16 39 23.0	4.299	13	6 24 30.75	2.4144	18 15 58.4	0.523
14	4 30 8.36	2.2302	16 43 38.4	4.215	14	6 26 55.71	2.4176	18 15 23.6	0.637
15	4 32 22.30	2.2345	16 47 48.8	4.131	15	6 29 20.86	2.4207	18 14 42.0	0.751
16	4 34 36.50	2.2389	16 51 54.1	4.045	16	6 31 46.19	2.4236	18 13 53.5	0.867
17	4 36 50.97	2.2433	16 55 54.2	3.958	17	6 34 11.69	2.4265	18 12 58.0	0.983
18	4 39 5.69	2.2475	16 59 49.1	3.871	18	6 36 37.37	2.4295	18 11 55.6	1.098
19	4 41 20.67	2.2518	17 3 38.7	3.782	19	6 39 3.23	2.4323	18 10 46.2	1.215
20	4 43 35.91	2.2562	17 7 23.0	3.693	20	6 41 29.25	2.4351	18 9 29.8	1.332
21	4 45 51.41	2.2605	17 11 1.9	3.604	21	6 43 55.44	2.4378	18 8 6.4	1.448
22	4 48 7.17	2.2648	17 14 35.5	3.514	22	6 46 21.79	2.4405	18 6 36.0	1.565
23	4 50 23.18	2.2690	17 18 3.6	3.423	23	6 48 48.30	2.4432	18 4 58.6	1.683
24	4 52 39.45	2.2733	N. 17 21 26.2	3.331	24	6 51 14.97	2.4458	N. 18 3 14.1	1.801



## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 5.					WEDNESDAY 7.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	6 51 14.97	2.4458	N. 18 3 14.1	1.801	0	8 50 29.56	2.5001	N. 14 21 3.6	7.360
1	6 53 41.79	2.4483	18 1 22.5	1.918	1	8 52 59.56	2.4998	14 13 38.8	7.466
2	6 56 8.76	2.4507	17 59 23.9	2.037	2	8 55 29.54	2.4995	14 6 7.7	7.570
3	6 58 35.87	2.4531	17 57 18.1	2.155	3	8 57 59.50	2.4992	13 58 30.4	7.673
4	7 1 3.13	2.4555	17 55 5.3	2.273	4	9 0 29.44	2.4988	13 50 46.9	7.777
5	7 3 30.53	2.4578	17 52 45.3	2.393	5	9 2 59.35	2.4983	13 42 57.2	7.878
6	7 5 58.06	2.4600	17 50 18.2	2.511	6	9 5 29.24	2.4978	13 35 1.5	7.979
7	7 8 25.73	2.4622	17 47 44.0	2.630	7	9 7 59.09	2.4973	13 26 59.7	8.079
8	7 10 53.53	2.4643	17 45 2.6	2.749	8	9 10 28.91	2.4968	13 18 52.0	8.178
9	7 13 21.45	2.4663	17 42 14.1	2.868	9	9 12 58.70	2.4962	13 10 38.3	8.277
10	7 15 49.49	2.4683	17 39 18.4	2.988	10	9 15 28.45	2.4955	13 2 18.8	8.373
11	7 18 17.65	2.4703	17 36 15.6	3.107	11	9 17 58.16	2.4948	12 53 53.5	8.469
12	7 20 45.93	2.4722	17 33 5.6	3.226	12	9 20 27.82	2.4940	12 45 22.5	8.564
13	7 23 14.32	2.4740	17 29 48.5	3.345	13	9 22 57.44	2.4933	12 36 45.8	8.659
14	7 25 42.81	2.4758	17 26 24.2	3.465	14	9 25 27.01	2.4924	12 28 3.4	8.753
15	7 28 11.41	2.4775	17 22 52.7	3.584	15	9 27 56.53	2.4916	12 19 15.5	8.845
16	7 30 40.11	2.4791	17 19 14.1	3.703	16	9 30 26.00	2.4908	12 10 22.0	8.936
17	7 33 8.90	2.4806	17 15 28.3	3.823	17	9 32 55.42	2.4898	12 1 23.2	9.025
18	7 35 37.78	2.4822	17 11 35.4	3.942	18	9 35 24.78	2.4889	11 52 19.0	9.114
19	7 38 6.76	2.4837	17 7 35.3	4.061	19	9 37 54.09	2.4879	11 43 9.5	9.202
20	7 40 35.82	2.4850	17 3 28.1	4.179	20	9 40 23.33	2.4868	11 33 54.7	9.289
21	7 43 4.96	2.4863	16 59 13.8	4.298	21	9 42 52.51	2.4858	11 24 34.8	9.373
22	7 45 34.18	2.4877	16 54 52.4	4.416	22	9 45 21.63	2.4847	11 15 9.9	9.458
23	7 48 3.48	2.4888	N. 16 50 23.9	4.534	23	9 47 50.68	2.4836	N. 11 5 39.9	9.541
TUESDAY 6.					THURSDAY 8.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	7 50 32.84	2.4899	N. 16 45 48.3	4.653	0	9 50 19.66	2.4825	N. 10 56 5.0	9.623
1	7 53 2.27	2.4911	16 41 5.6	4.770	1	9 52 48.58	2.4813	10 46 25.2	9.703
2	7 55 31.77	2.4921	16 36 15.9	4.888	2	9 55 17.42	2.4802	10 36 40.7	9.782
3	7 58 1.32	2.4930	16 31 19.1	5.005	3	9 57 46.20	2.4790	10 26 51.4	9.860
4	8 0 30.93	2.4939	16 26 15.3	5.122	4	10 0 14.90	2.4778	10 16 57.5	9.937
5	8 3 0.59	2.4948	16 21 4.5	5.238	5	10 2 43.53	2.4765	10 6 59.0	10.012
6	8 5 30.30	2.4956	16 15 46.7	5.355	6	10 5 12.08	2.4752	9 56 56.0	10.086
7	8 8 0.06	2.4963	16 10 21.9	5.471	7	10 7 40.55	2.4738	9 46 48.7	10.158
8	8 10 29.86	2.4970	16 4 50.2	5.586	8	10 10 8.94	2.4726	9 36 37.0	10.230
9	8 12 59.70	2.4976	15 59 11.6	5.701	9	10 12 37.26	2.4712	9 26 21.1	10.300
10	8 15 29.57	2.4982	15 53 26.1	5.816	10	10 15 5.49	2.4698	9 16 1.0	10.369
11	8 17 59.48	2.4987	15 47 33.7	5.930	11	10 17 33.64	2.4685	9 5 36.8	10.436
12	8 20 29.41	2.4991	15 41 34.5	6.043	12	10 20 1.71	2.4671	8 55 8.7	10.502
13	8 22 59.37	2.4995	15 35 28.5	6.157	13	10 22 29.69	2.4657	8 44 36.6	10.567
14	8 25 29.35	2.4998	15 29 15.7	6.269	14	10 24 57.59	2.4643	8 34 0.7	10.629
15	8 27 59.34	2.5000	15 22 56.2	6.381	15	10 27 25.40	2.4628	8 23 21.1	10.690
16	8 30 29.35	2.5003	15 16 30.0	6.492	16	10 29 53.13	2.4614	8 12 37.9	10.750
17	8 32 59.37	2.5004	15 9 57.1	6.603	17	10 32 20.77	2.4599	8 1 51.1	10.809
18	8 35 29.40	2.5005	15 3 17.6	6.713	18	10 34 48.32	2.4585	7 51 0.8	10.867
19	8 37 59.43	2.5006	14 56 31.5	6.823	19	10 37 15.79	2.4570	7 40 7.1	10.923
20	8 40 29.47	2.5006	14 49 38.9	6.932	20	10 39 43.16	2.4555	7 29 10.1	10.977
21	8 42 59.50	2.5005	14 42 39.7	7.040	21	10 42 10.45	2.4541	7 18 9.9	11.029
22	8 45 29.53	2.5004	14 35 34.1	7.147	22	10 44 37.65	2.4525	7 7 6.6	11.080
23	8 47 59.55	2.5003	14 28 22.0	7.254	23	10 47 4.75	2.4510	6 56 0.3	11.130
24	8 50 29.56	2.5001	N. 14 21 3.6	7.360	24	10 49 31.77	2.4496	N. 6 44 51.0	11.178

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 9.					SUNDAY 11.				
0	10 49 31.77	2.4496	N. 6 44 51.0	11.178	0	12 45 24.85	2.3823	S. 2 37 44.6	11.667
1	10 51 58.70	2.4480	6 33 38.9	11.225	1	12 47 47.76	2.3813	2 49 23.9	11.641
2	10 54 25.53	2.4464	6 22 24.0	11.271	2	12 50 10.60	2.3801	3 1 1.5	11.613
3	10 56 52.27	2.4449	6 11 6.4	11.314	3	12 52 33.37	2.3790	3 12 37.4	11.583
4	10 59 18.92	2.4434	5 59 46.3	11.356	4	12 54 56.08	2.3780	3 24 11.5	11.552
5	11 1 45.48	2.4419	5 48 23.7	11.397	5	12 57 18.73	2.3769	3 35 43.6	11.519
6	11 4 11.95	2.4404	5 36 58.7	11.436	6	12 59 41.31	2.3758	3 47 13.8	11.486
7	11 6 38.33	2.4388	5 25 31.4	11.473	7	13 2 3.83	2.3748	3 58 41.9	11.450
8	11 9 4.61	2.4373	5 14 1.9	11.509	8	13 4 26.29	2.3738	4 10 7.8	11.413
9	11 11 30.80	2.4358	5 2 30.3	11.543	9	13 6 48.68	2.3728	4 21 31.5	11.376
10	11 13 56.90	2.4343	4 50 56.7	11.576	10	13 9 11.02	2.3718	4 32 52.9	11.337
11	11 16 22.91	2.4327	4 39 21.2	11.608	11	13 11 33.29	2.3708	4 44 11.9	11.296
12	11 18 48.82	2.4312	4 27 43.8	11.638	12	13 13 55.51	2.3698	4 55 28.4	11.254
13	11 21 14.65	2.4297	4 16 4.7	11.665	13	13 16 17.67	2.3688	5 6 42.4	11.212
14	11 23 40.38	2.4282	4 4 24.0	11.692	14	13 18 39.77	2.3678	5 17 53.8	11.168
15	11 26 6.03	2.4267	3 52 41.7	11.717	15	13 21 1.81	2.3669	5 29 2.5	11.122
16	11 28 31.58	2.4251	3 40 58.0	11.740	16	13 23 23.80	2.3660	5 40 8.4	11.075
17	11 30 57.04	2.4237	3 29 12.9	11.762	17	13 25 45.73	2.3651	5 51 11.5	11.027
18	11 33 22.42	2.4222	3 17 26.6	11.782	18	13 28 7.61	2.3643	6 2 11.6	10.978
19	11 35 47.70	2.4207	3 5 39.1	11.801	19	13 30 29.44	2.3633	6 13 8.8	10.928
20	11 38 12.90	2.4192	2 53 50.5	11.818	20	13 32 51.21	2.3624	6 24 2.9	10.876
21	11 40 38.00	2.4177	2 42 0.9	11.833	21	13 35 12.93	2.3615	6 34 53.9	10.823
22	11 43 3.02	2.4163	2 30 10.5	11.847	22	13 37 34.59	2.3607	6 45 41.7	10.769
23	11 45 27.95	2.4148	N. 2 18 19.2	11.860	23	13 39 56.21	2.3598	S. 6 56 26.2	10.713
SATURDAY 10.					MONDAY 12.				
0	11 47 52.80	2.4134	N. 2 6 27.3	11.870	0	13 42 17.77	2.3589	S. 7 7 7.3	10.657
1	11 50 17.56	2.4119	1 54 34.8	11.879	1	13 44 39.28	2.3581	7 17 45.0	10.600
2	11 52 42.23	2.4105	1 42 41.8	11.887	2	13 47 0.74	2.3573	7 28 19.3	10.542
3	11 55 6.82	2.4092	1 30 48.3	11.893	3	13 49 22.16	2.3565	7 38 50.0	10.482
4	11 57 31.33	2.4078	1 18 54.6	11.898	4	13 51 43.52	2.3557	7 49 17.1	10.421
5	11 59 55.75	2.4063	1 7 0.6	11.901	5	13 54 4.84	2.3549	7 59 40.5	10.359
6	12 2 20.09	2.4050	0 55 6.5	11.902	6	13 56 26.11	2.3541	8 10 0.2	10.297
7	12 4 44.35	2.4036	0 43 12.4	11.902	7	13 58 47.33	2.3533	8 20 16.1	10.233
8	12 7 8.52	2.4023	0 31 18.3	11.900	8	14 1 8.50	2.3525	8 30 28.1	10.168
9	12 9 32.62	2.4009	0 19 24.4	11.897	9	14 3 29.63	2.3518	8 40 36.2	10.103
10	12 11 56.63	2.3996	N. 0 7 30.7	11.892	10	14 5 50.71	2.3509	8 50 40.4	10.036
11	12 14 20.57	2.3983	S. 0 4 22.6	11.885	11	14 8 11.74	2.3502	9 0 40.5	9.968
12	12 16 44.42	2.3969	0 16 15.5	11.878	12	14 10 32.73	2.3494	9 10 36.5	9.898
13	12 19 8.20	2.3957	0 28 7.9	11.868	13	14 12 53.67	2.3487	9 20 28.3	9.828
14	12 21 31.90	2.3944	0 39 59.7	11.857	14	14 15 14.57	2.3479	9 30 15.9	9.758
15	12 23 55.53	2.3932	0 51 50.8	11.845	15	14 17 35.42	2.3472	9 39 59.3	9.687
16	12 26 19.08	2.3918	1 3 41.1	11.831	16	14 19 56.23	2.3464	9 49 38.3	9.613
17	12 28 42.55	2.3906	1 15 30.5	11.816	17	14 22 16.99	2.3457	9 59 12.9	9.540
18	12 31 5.95	2.3894	1 27 19.0	11.799	18	14 24 37.71	2.3450	10 8 43.1	9.467
19	12 33 29.28	2.3882	1 39 6.4	11.781	19	14 26 58.39	2.3443	10 18 8.9	9.392
20	12 35 52.54	2.3870	1 50 52.7	11.762	20	14 29 19.02	2.3435	10 27 30.1	9.316
21	12 38 15.72	2.3858	2 2 37.8	11.740	21	14 31 39.61	2.3428	10 36 46.8	9.239
22	12 40 38.84	2.3847	2 14 21.5	11.717	22	14 34 0.15	2.3420	10 45 58.8	9.161
23	12 43 1.88	2.3834	2 26 3.8	11.693	23	14 36 20.65	2.3413	10 55 6.1	9.083
24	12 45 24.85	2.3823	S. 2 37 44.6	11.667	24	14 38 41.10	2.3405	S. 11 4 8.7	9.003

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 13.					THURSDAY 15.				
0	14 38 41.10	2.3405	S. 11 4 8.7	9.003	0	16 30 3.11	2.2951	S. 16 33 34.3	4.558
1	14 41 1.51	2.3398	11 13 6.5	8.923	1	16 32 20.78	2.2938	16 38 4.8	4.458
2	14 43 21.88	2.3391	11 21 59.5	8.843	2	16 34 38.36	2.2923	16 42 29.2	4.357
3	14 45 42.20	2.3383	11 30 47.6	8.761	3	16 36 55.86	2.2910	16 46 47.6	4.256
4	14 48 2.47	2.3375	11 39 30.8	8.678	4	16 39 13.28	2.2896	16 50 59.9	4.155
5	14 50 22.70	2.3368	11 48 9.0	8.596	5	16 41 30.61	2.2882	16 55 6.2	4.055
6	14 52 42.89	2.3361	11 56 42.3	8.513	6	16 43 47.86	2.2868	16 59 6.5	3.954
7	14 55 3.03	2.3353	12 5 10.5	8.428	7	16 46 5.03	2.2853	17 3 0.7	3.853
8	14 57 23.13	2.3346	12 13 33.7	8.343	8	16 48 22.10	2.2838	17 6 48.8	3.752
9	14 59 43.18	2.3338	12 21 51.7	8.258	9	16 50 39.08	2.2823	17 10 30.9	3.651
10	15 2 3.18	2.3330	12 30 4.6	8.171	10	16 52 55.98	2.2808	17 14 6.9	3.549
11	15 4 23.14	2.3322	12 38 12.2	8.084	11	16 55 12.78	2.2792	17 17 36.8	3.448
12	15 6 43.05	2.3314	12 46 14.7	7.997	12	16 57 29.48	2.2776	17 21 0.7	3.348
13	15 9 2.91	2.3307	12 54 11.9	7.908	13	16 59 46.09	2.2761	17 24 18.5	3.247
14	15 11 22.73	2.3298	13 2 3.7	7.819	14	17 2 2.61	2.2745	17 27 30.3	3.146
15	15 13 42.49	2.3290	13 9 50.2	7.731	15	17 4 19.03	2.2728	17 30 36.0	3.044
16	15 16 2.21	2.3283	13 17 31.4	7.641	16	17 6 35.35	2.2712	17 33 35.6	2.943
17	15 18 21.88	2.3274	13 25 7.1	7.550	17	17 8 51.57	2.2695	17 36 29.2	2.843
18	15 20 41.50	2.3266	13 32 37.4	7.459	18	17 11 7.69	2.2678	17 39 16.8	2.743
19	15 23 1.07	2.3258	13 40 2.2	7.368	19	17 13 23.71	2.2661	17 41 58.3	2.642
20	15 25 20.59	2.3249	13 47 21.6	7.277	20	17 15 39.62	2.2643	17 44 33.8	2.541
21	15 27 40.06	2.3241	13 54 35.4	7.183	21	17 17 55.42	2.2624	17 47 3.2	2.440
22	15 29 59.48	2.3232	14 1 43.6	7.091	22	17 20 11.11	2.2607	17 49 26.6	2.340
23	15 32 18.84	2.3222	S. 14 8 46.3	6.998	23	17 22 26.70	2.2588	S. 17 51 44.0	2.240
WEDNESDAY 14.					FRIDAY 16.				
0	15 34 38.14	2.3213	S. 14 15 43.4	6.904	0	17 24 42.17	2.2570	S. 17 53 55.4	2.140
1	15 36 57.39	2.3204	14 22 34.8	6.810	1	17 26 57.54	2.2552	17 56 0.8	2.039
2	15 39 16.59	2.3195	14 29 20.6	6.716	2	17 29 12.79	2.2533	17 58 0.1	1.939
3	15 41 35.73	2.3185	14 36 0.7	6.621	3	17 31 27.95	2.2513	17 59 53.5	1.840
4	15 43 54.81	2.3176	14 42 35.1	6.525	4	17 33 42.95	2.2494	18 1 40.9	1.740
5	15 46 13.84	2.3167	14 49 3.7	6.429	5	17 35 57.86	2.2475	18 3 22.3	1.641
6	15 48 32.81	2.3157	14 55 26.6	6.333	6	17 38 12.65	2.2454	18 4 57.8	1.542
7	15 50 51.72	2.3147	15 1 43.7	6.237	7	17 40 27.31	2.2434	18 6 27.3	1.443
8	15 53 10.57	2.3137	15 7 55.0	6.140	8	17 42 41.86	2.2415	18 7 50.9	1.343
9	15 55 29.36	2.3126	15 14 0.5	6.043	9	17 44 56.29	2.2394	18 9 8.5	1.245
10	15 57 48.08	2.3115	15 20 0.2	5.946	10	17 47 10.59	2.2373	18 10 20.3	1.147
11	16 0 6.74	2.3105	15 25 54.0	5.848	11	17 49 24.77	2.2353	18 11 26.1	1.048
12	16 2 25.34	2.3094	15 31 42.0	5.751	12	17 51 38.82	2.2332	18 12 26.0	0.950
13	16 4 43.87	2.3083	15 37 24.1	5.652	13	17 53 52.75	2.2311	18 13 20.1	0.853
14	16 7 2.33	2.3073	15 43 0.2	5.553	14	17 56 6.55	2.2288	18 14 8.3	0.754
15	16 9 20.74	2.3062	15 48 30.4	5.454	15	17 58 20.21	2.2267	18 14 50.6	0.657
16	16 11 39.07	2.3049	15 53 54.7	5.356	16	18 0 33.75	2.2246	18 15 27.1	0.560
17	16 13 57.33	2.3038	15 59 13.1	5.257	17	18 2 47.16	2.2223	18 15 57.8	0.463
18	16 16 15.52	2.3026	16 4 25.5	5.157	18	18 5 0.43	2.2201	18 16 22.7	0.367
19	16 18 33.64	2.3013	16 9 31.9	5.058	19	18 7 13.57	2.2178	18 16 41.8	0.270
20	16 20 51.68	2.3001	16 14 32.4	4.958	20	18 9 26.57	2.2156	18 16 55.1	0.174
21	16 23 9.65	2.2989	16 19 26.9	4.858	21	18 11 39.44	2.2133	18 17 2.7	-0.078
22	16 25 27.55	2.2977	16 24 15.4	4.758	22	18 13 52.17	2.2109	18 17 4.5	+0.018
23	16 27 45.37	2.2963	16 28 57.8	4.658	23	18 16 4.75	2.2086	18 17 0.6	0.113
24	16 30 3.11	2.2951	S. 16 33 34.3	4.558	24	18 18 17.20	2.2063	S. 18 16 51.0	0.208

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 17.					MONDAY 19.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	18 18 17.20	2.2063	S. 18 16 51.0	0.208	0	20 1 13.67	2.0798	S. 16 24 46.8	4.298
1	18 20 29.51	2.2039	18 16 35.7	0.302	1	20 3 18.38	2.0771	16 20 26.7	4.372
2	18 22 41.67	2.2015	18 16 14.8	0.395	2	20 5 22.92	2.0743	16 16 2.2	4.445
3	18 24 53.69	2.1992	18 15 48.3	0.489	3	20 7 27.30	2.0716	16 11 33.3	4.518
4	18 27 5.57	2.1968	18 15 16.1	0.583	4	20 9 31.51	2.0688	16 7 0.0	4.591
5	18 29 17.30	2.1943	18 14 38.3	0.677	5	20 11 35.56	2.0662	16 2 22.4	4.663
6	18 31 28.89	2.1918	18 13 54.9	0.769	6	20 13 39.45	2.0634	15 57 40.4	4.735
7	18 33 40.32	2.1893	18 13 6.0	0.862	7	20 15 43.17	2.0607	15 52 54.2	4.805
8	18 35 51.61	2.1869	18 12 11.5	0.954	8	20 17 46.73	2.0580	15 48 3.8	4.876
9	18 38 2.75	2.1844	18 11 11.5	1.046	9	20 19 50.13	2.0553	15 43 9.1	4.946
10	18 40 13.74	2.1819	18 10 6.0	1.137	10	20 21 53.37	2.0527	15 38 10.3	5.015
11	18 42 24.58	2.1793	18 8 55.1	1.228	11	20 23 56.45	2.0499	15 33 7.3	5.084
12	18 44 35.26	2.1768	18 7 38.7	1.319	12	20 25 59.36	2.0474	15 28 0.2	5.152
13	18 46 45.79	2.1743	18 6 16.8	1.410	13	20 28 2.11	2.0446	15 22 49.0	5.220
14	18 48 56.17	2.1717	18 4 49.5	1.499	14	20 30 4.71	2.0419	15 17 33.8	5.288
15	18 51 6.39	2.1691	18 3 16.9	1.588	15	20 32 7.14	2.0393	15 12 14.5	5.355
16	18 53 16.46	2.1665	18 1 38.9	1.678	16	20 34 9.42	2.0367	15 6 51.2	5.421
17	18 55 26.37	2.1639	17 59 55.5	1.767	17	20 36 11.54	2.0340	15 1 24.0	5.486
18	18 57 36.13	2.1613	17 58 6.8	1.855	18	20 38 13.50	2.0313	14 55 52.9	5.551
19	18 59 45.73	2.1587	17 56 12.9	1.943	19	20 40 15.30	2.0288	14 50 17.9	5.616
20	19 1 55.17	2.1560	17 54 13.7	2.030	20	20 42 16.95	2.0263	14 44 39.0	5.680
21	19 4 4.45	2.1534	17 52 9.3	2.117	21	20 44 18.45	2.0237	14 38 56.3	5.743
22	19 6 13.58	2.1508	17 49 59.6	2.204	22	20 46 19.79	2.0210	14 33 9.8	5.807
23	19 8 22.55	2.1481	S. 17 47 44.8	2.290	23	20 48 20.97	2.0184	S. 14 27 19.5	5.870
SUNDAY 18.					TUESDAY 20.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	19 10 31.35	2.1454	S. 17 45 24.8	2.376	0	20 50 22.00	2.0159	S. 14 21 25.4	5.932
1	19 12 40.00	2.1428	17 42 59.7	2.462	1	20 52 22.88	2.0134	14 15 27.7	5.993
2	19 14 48.48	2.1400	17 40 29.4	2.547	2	20 54 23.61	2.0108	14 9 26.3	6.054
3	19 16 56.80	2.1373	17 37 54.1	2.631	3	20 56 24.16	2.0083	14 3 21.2	6.114
4	19 19 4.96	2.1346	17 35 13.7	2.715	4	20 58 24.61	2.0059	13 57 12.6	6.173
5	19 21 12.95	2.1318	17 32 28.3	2.799	5	21 0 24.89	2.0034	13 51 0.4	6.233
6	19 23 20.78	2.1292	17 29 37.8	2.882	6	21 2 25.02	2.0009	13 44 44.6	6.292
7	19 25 28.45	2.1265	17 26 42.4	2.964	7	21 4 25.00	1.9985	13 38 25.3	6.350
8	19 27 35.96	2.1238	17 23 42.1	3.047	8	21 6 24.84	1.9962	13 32 2.6	6.408
9	19 29 43.31	2.1211	17 20 36.8	3.129	9	21 8 24.54	1.9938	13 25 36.4	6.465
10	19 31 50.49	2.1183	17 17 26.6	3.210	10	21 10 24.09	1.9913	13 19 6.8	6.522
11	19 33 57.50	2.1155	17 14 11.6	3.290	11	21 12 23.50	1.9889	13 12 33.8	6.578
12	19 36 4.35	2.1128	17 10 51.8	3.371	12	21 14 22.76	1.9866	13 5 57.5	6.633
13	19 38 11.03	2.1100	17 7 27.1	3.451	13	21 16 21.89	1.9843	12 59 17.9	6.688
14	19 40 17.55	2.1073	17 3 57.7	3.530	14	21 18 20.87	1.9819	12 52 35.0	6.742
15	19 42 23.90	2.1045	17 0 23.5	3.609	15	21 20 19.72	1.9797	12 45 48.8	6.797
16	19 44 30.09	2.1018	16 56 44.6	3.688	16	21 22 18.43	1.9773	12 38 59.4	6.850
17	19 46 36.11	2.0990	16 53 1.0	3.766	17	21 24 17.00	1.9751	12 32 6.8	6.903
18	19 48 41.97	2.0963	16 49 12.7	3.843	18	21 26 15.44	1.9729	12 25 11.1	6.954
19	19 50 47.66	2.0935	16 45 19.8	3.920	19	21 28 13.75	1.9707	12 18 12.3	7.006
20	19 52 53.19	2.0908	16 41 22.3	3.997	20	21 30 11.92	1.9684	12 11 10.4	7.057
21	19 54 58.56	2.0881	16 37 20.2	4.073	21	21 32 9.96	1.9662	12 4 5.5	7.108
22	19 57 3.76	2.0853	16 33 13.6	4.148	22	21 34 7.87	1.9641	11 56 57.5	7.158
23	19 59 8.80	2.0826	16 29 2.5	4.223	23	21 36 5.65	1.9620	11 49 46.6	7.207
24	20 1 13.67	2.0798	S. 16 24 46.8	4.298	24	21 38 3.31	1.9599	S. 11 42 32.7	7.256

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 21.					FRIDAY 23.				
	h m s	s	° "	"		h m s	s	° "	"
0	21 38 3.31	1.9599	S. 11 42 32.7	7.256	0	23 10 11.01	1.8898	S. 5 8 32.8	8.944
1	21 40 0.84	1.9578	11 35 15.9	7.304	1	23 12 4 37	1.8890	4 59 35.5	8.966
2	21 41 58.24	1.9557	11 27 56.2	7.352	2	23 13 57.69	1.8883	4 50 36.9	8.987
3	21 43 55.52	1.9537	11 20 33.6	7.399	3	23 15 50.96	1.8876	4 41 37.1	9.007
4	21 45 52.68	1.9517	11 13 8.3	7.446	4	23 17 44.20	1.8870	4 32 36.1	9.027
5	21 47 49.72	1.9497	11 5 40.1	7.493	5	23 19 37.40	1.8864	4 23 33.9	9.046
6	21 49 46.64	1.9477	10 58 9.2	7.538	6	23 21 30.57	1.8858	4 14 30.6	9.061
7	21 51 43.44	1.9458	10 50 35.6	7.583	7	23 23 23.70	1.8853	4 5 26.2	9.082
8	21 53 40.13	1.9438	10 42 59.3	7.627	8	23 25 16.80	1.8848	3 56 20.8	9.099
9	21 55 36.70	1.9419	10 35 20.4	7.671	9	23 27 9.88	1.8844	3 47 14.3	9.117
10	21 57 33.16	1.9401	10 27 38.8	7.714	10	23 29 2.93	1.8839	3 38 6.8	9.133
11	21 59 29.51	1.9383	10 19 54.7	7.756	11	23 30 55.95	1.8835	3 28 58.4	9.148
12	22 1 25.75	1.9364	10 12 8.1	7.798	12	23 32 48.95	1.8832	3 19 49.0	9.163
13	22 3 21.88	1.9346	10 4 18.9	7.841	13	23 34 41.93	1.8828	3 10 38.8	9.178
14	22 5 17.90	1.9328	9 56 27.2	7.882	14	23 36 34.89	1.8825	3 1 27.7	9.192
15	22 7 13.82	1.9311	9 48 33.1	7.923	15	23 38 27.83	1.8823	2 52 15.8	9.205
16	22 9 9.63	1.9293	9 40 36.5	7.963	16	23 40 20.76	1.8821	2 43 3.1	9.218
17	22 11 5.34	1.9277	9 32 37.6	8.002	17	23 42 13.68	1.8819	2 33 49.6	9.230
18	22 13 0.96	1.9261	9 24 36.3	8.041	18	23 44 6.59	1.8818	2 24 35.5	9.241
19	22 14 56.47	1.9243	9 16 32.7	8.079	19	23 45 59.49	1.8816	2 15 20.7	9.252
20	22 16 51.88	1.9228	9 8 26.8	8.117	20	23 47 52.38	1.8815	2 6 5.3	9.263
21	22 18 47.20	1.9213	9 0 18.7	8.153	21	23 49 45.27	1.8815	1 56 49.2	9.273
22	22 20 42.43	1.9197	8 52 8.4	8.190	22	23 51 38.16	1.8814	1 47 32.6	9.281
23	22 22 37.56	1.9181	S. 8 43 55.9	8.227	23	23 53 31.04	1.8814	S. 1 38 15.5	9.290
THURSDAY 22.					SATURDAY 24.				
	h m s	s	° "	"		h m s	s	° "	"
0	22 24 32.60	1.9166	S. 8 35 41.2	8.263	0	23 55 23.93	1.8815	S. 1 28 57.8	9.298
1	22 26 27.55	1.9151	8 27 24.4	8.298	1	23 57 16.82	1.8816	1 19 39.7	9.305
2	22 28 22.41	1.9137	8 19 5.5	8.332	2	23 59 9.72	1.8817	1 10 21.2	9.313
3	22 30 17.19	1.9123	8 10 44.6	8.365	3	0 1 2.62	1.8818	1 1 2.2	9.319
4	22 32 11.89	1.9109	8 2 21.7	8.398	4	0 2 55.54	1.8821	0 51 42.9	9.324
5	22 34 6.50	1.9096	7 53 56.8	8.431	5	0 4 48.47	1.8823	0 42 23.3	9.329
6	22 36 1.04	1.9083	7 45 30.0	8.463	6	0 6 41.41	1.8825	0 33 3.4	9.334
7	22 37 55.49	1.9069	7 37 1.2	8.495	7	0 8 34.37	1.8828	0 23 43.2	9.338
8	22 39 49.87	1.9057	7 28 30.6	8.526	8	0 10 27.35	1.8832	0 14 22.8	9.341
9	22 41 44.17	1.9044	7 19 58.1	8.557	9	0 12 20.35	1.8835	S. 0 5 2.3	9.343
10	22 43 38.40	1.9033	7 11 23.8	8.587	10	0 14 13.37	1.8839	N. 0 4 18.4	9.346
11	22 45 32.56	1.9021	7 2 47.7	8.616	11	0 16 6.42	1.8844	0 13 39.2	9.347
12	22 47 26.65	1.9009	6 54 9.9	8.644	12	0 17 59.50	1.8849	0 23 0.1	9.348
13	22 49 20.67	1.8998	6 45 30.4	8.673	13	0 19 52.61	1.8853	0 32 21.0	9.348
14	22 51 14.63	1.8988	6 36 49.2	8.700	14	0 21 45.74	1.8858	0 41 41.9	9.348
15	22 53 8.52	1.8978	6 28 6.4	8.728	15	0 23 38.91	1.8865	0 51 2.8	9.348
16	22 55 2.36	1.8968	6 19 21.9	8.754	16	0 25 32.12	1.8872	1 0 23.7	9.347
17	22 56 56.13	1.8957	6 10 35.9	8.779	17	0 27 25.37	1.8878	1 9 44.4	9.344
18	22 58 49.84	1.8948	6 1 48.4	8.805	18	0 29 18.65	1.8884	1 19 5.0	9.342
19	23 0 43.50	1.8938	5 52 59.3	8.829	19	0 31 11.98	1.8892	1 28 25.4	9.338
20	23 2 37.10	1.8929	5 44 8.8	8.853	20	0 33 5.35	1.8899	1 37 45.6	9.334
21	23 4 30.65	1.8921	5 35 16.9	8.877	21	0 34 58.77	1.8907	1 47 5.5	9.329
22	23 6 24.15	1.8913	5 26 23.5	8.901	22	0 36 52.23	1.8915	1 56 25.1	9.325
23	23 8 17.60	1.8905	5 17 28.8	8.923	23	0 38 45.75	1.8924	2 5 44.5	9.319
24	23 10 11.01	1.8898	S. 5 8 32.8	8.944	24	0 40 39.32	1.8933	N. 2 15 3.4	9.313

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 25.					TUESDAY 27.				
0	h m s	s	N. ° "	"	0	h m s	s	N. ° "	"
0	0 40 39.32	1.8933	2 15 3.4	9.313	0	2 13 13.30	1.9764	9 23 2.7	8.276
1	0 42 32.94	1.8942	2 24 22.0	9.306	1	2 15 11.96	1.9789	9 31 18.1	8.238
2	0 44 26.62	1.8952	2 33 40.1	9.298	2	2 17 10.77	1.9815	9 39 31.2	8.199
3	0 46 20.36	1.8962	2 42 57.8	9.291	3	2 19 9.74	1.9841	9 47 42.0	8.161
4	0 48 14.16	1.8973	2 52 15.0	9.282	4	2 21 8.86	1.9867	9 55 50.5	8.122
5	0 50 8.03	1.8983	3 1 31.6	9.273	5	2 23 8.14	1.9893	10 3 56.6	8.082
6	0 52 1.96	1.8994	3 10 47.7	9.263	6	2 25 7.57	1.9919	10 12 0.3	8.041
7	0 53 55.96	1.9005	3 20 3.1	9.252	7	2 27 7.17	1.9947	10 20 1.5	7.999
8	0 55 50.02	1.9017	3 29 17.9	9.241	8	2 29 6.93	1.9973	10 28 0.2	7.957
9	0 57 44.16	1.9029	3 38 32.0	9.229	9	2 31 6.85	2.0001	10 35 56.3	7.914
10	0 59 38.37	1.9042	3 47 45.4	9.217	10	2 33 6.94	2.0029	10 43 49.9	7.871
11	1 1 32.66	1.9055	3 56 58.0	9.203	11	2 35 7.20	2.0057	10 51 40.8	7.827
12	1 3 27.03	1.9068	4 6 9.8	9.190	12	2 37 7.63	2.0085	10 59 29.1	7.782
13	1 5 21.48	1.9082	4 15 20.8	9.176	13	2 39 8.22	2.0113	11 7 14.6	7.736
14	1 7 16.01	1.9095	4 24 30.9	9.161	14	2 41 8.99	2.0142	11 14 57.4	7.690
15	1 9 10.62	1.9109	4 33 40.1	9.145	15	2 43 9.93	2.0171	11 22 37.4	7.643
16	1 11 5.32	1.9124	4 42 48.3	9.129	16	2 45 11.04	2.0200	11 30 14.6	7.596
17	1 13 0.11	1.9139	4 51 55.6	9.113	17	2 47 12.33	2.0230	11 37 48.9	7.547
18	1 14 54.99	1.9154	5 1 1.9	9.096	18	2 49 13.80	2.0260	11 45 20.3	7.498
19	1 16 49.96	1.9170	5 10 7.1	9.077	19	2 51 15.45	2.0289	11 52 48.7	7.448
20	1 18 45.03	1.9186	5 19 11.2	9.058	20	2 53 17.27	2.0319	12 0 14.1	7.398
21	1 20 40.19	1.9202	5 28 14.1	9.039	21	2 55 19.28	2.0350	12 7 36.5	7.348
22	1 22 35.45	1.9218	5 37 15.9	9.019	22	2 57 21.47	2.0380	12 14 55.8	7.296
23	1 24 30.81	1.9235	N. 5 46 16.4	8.998	23	2 59 23.84	2.0411	N. 12 22 12.0	7.243
MONDAY 26.					WEDNESDAY 28.				
0	1 26 26.27	1.9253	N. 5 55 15.7	8.978	0	3 1 26.40	2.0443	N. 12 29 25.0	7.190
1	1 28 21.84	1.9270	6 4 13.7	8.956	1	3 3 29.15	2.0473	12 36 34.8	7.137
2	1 30 17.51	1.9288	6 13 10.4	8.933	2	3 5 32.08	2.0504	12 43 41.4	7.083
3	1 32 13.29	1.9307	6 22 5.7	8.910	3	3 7 35.20	2.0537	12 50 44.7	7.028
4	1 34 9.19	1.9326	6 30 59.6	8.886	4	3 9 38.52	2.0568	12 57 44.7	6.972
5	1 36 5.20	1.9344	6 39 52.0	8.862	5	3 11 42.02	2.0600	13 4 41.3	6.915
6	1 38 1.32	1.9363	6 48 43.0	8.837	6	3 13 45.72	2.0633	13 11 34.5	6.858
7	1 39 57.56	1.9383	6 57 32.4	8.811	7	3 15 49.61	2.0664	13 18 24.2	6.800
8	1 41 53.91	1.9403	7 6 20.3	8.785	8	3 17 53.69	2.0697	13 25 10.5	6.742
9	1 43 50.39	1.9423	7 15 6.6	8.758	9	3 19 57.97	2.0730	13 31 53.2	6.683
10	1 45 46.99	1.9443	7 23 51.2	8.730	10	3 22 2.45	2.0763	13 38 32.4	6.623
11	1 47 43.71	1.9464	7 32 34.2	8.702	11	3 24 7.13	2.0796	13 45 7.9	6.562
12	1 49 40.56	1.9486	7 41 15.5	8.673	12	3 26 12.00	2.0828	13 51 39.8	6.501
13	1 51 37.54	1.9508	7 49 55.0	8.643	13	3 28 17.07	2.0862	13 58 8.0	6.438
14	1 53 34.65	1.9529	7 58 32.7	8.613	14	3 30 22.34	2.0896	14 4 32.4	6.376
15	1 55 31.89	1.9551	8 7 8.6	8.583	15	3 32 27.82	2.0930	14 10 53.1	6.313
16	1 57 29.26	1.9573	8 15 42.6	8.551	16	3 34 33.50	2.0963	14 17 9.9	6.248
17	1 59 26.77	1.9597	8 24 14.7	8.519	17	3 36 39.38	2.0997	14 23 22.9	6.184
18	2 1 24.42	1.9620	8 32 44.9	8.486	18	3 38 45.46	2.1031	14 29 32.0	6.118
19	2 3 22.21	1.9643	8 41 13.0	8.452	19	3 40 51.75	2.1065	14 35 37.1	6.053
20	2 5 20.14	1.9667	8 49 39.1	8.418	20	3 42 58.24	2.1099	14 41 38.3	5.986
21	2 7 18.21	1.9691	8 58 3.2	8.384	21	3 45 4.94	2.1133	14 47 35.4	5.918
22	2 9 16.43	1.9715	9 6 25.2	8.348	22	3 47 11.84	2.1168	14 53 28.5	5.850
23	2 11 14.79	1.9739	9 14 45.0	8.312	23	3 49 18.95	2.1203	14 59 17.4	5.781
24	2 13 13.30	1.9764	N. 9 23 2.7	8.276	24	3 51 26.27	2.1238	N. 15 5 2.2	5.713

GREENWICH MEAN TIME.									
THE MOON'S RIGHT ASCENSION AND DECLINATION.									
Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 29.					SATURDAY, OCTOBER 1.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	3 51 26.27	2.1238	N.15 5 2.2	5.713	0	5 37 22.18	2.2869	N.18 6 32.9	1.613
1	3 53 33.80	2.1273	15 10 42.8	5.641	<div>PHASES OF THE MOON.</div> <div><div>☾ Last Quarter . . . Sept. 2 14 58.5</div><div>● New Moon . . . . . 9 8 42.8</div><div>☾ First Quarter . . . . . 16 3 12.7</div><div>○ Full Moon . . . . . 24 5 49.7</div></div>				
2	3 55 41.54	2.1307	15 16 19.1	5.570					
3	3 57 49.48	2.1341	15 21 51.2	5.499					
4	3 59 57.63	2.1377	15 27 19.0	5.427					
5	4 2 6.00	2.1412	15 32 42.4	5.354					
6	4 4 14.57	2.1446	15 38 1.5	5.281					
7	4 6 23.35	2.1482	15 43 16.1	5.206					
8	4 8 32.35	2.1517	15 48 26.2	5.131					
9	4 10 41.55	2.1552	15 53 31.8	5.055					
10	4 12 50.97	2.1588	15 58 32.8	4.978					
11	4 15 0.59	2.1622	16 3 29.2	4.902					
12	4 17 10.43	2.1657	16 8 21.0	4.824					
13	4 19 20.47	2.1692	16 13 8.1	4.746					
14	4 21 30.73	2.1728	16 17 50.5	4.667					
15	4 23 41.20	2.1763	16 22 28.1	4.587					
16	4 25 51.88	2.1798	16 27 0.9	4.507					
17	4 28 2.77	2.1833	16 31 28.9	4.427					
18	4 30 13.87	2.1868	16 35 52.1	4.345					
19	4 32 25.18	2.1903	16 40 10.3	4.262					
20	4 34 36.70	2.1938	16 44 23.5	4.179					
21	4 36 48.43	2.1973	16 48 31.8	4.096					
22	4 39 0.37	2.2008	16 52 35.0	4.012					
23	4 41 12.52	2.2043	N.16 56 33.2	3.927					
FRIDAY 30.									
0	4 43 24.88	2.2078	N.17 0 26.2	3.841	<div><div>☾ Perigee . . . . . Sept. 9 7.2</div><div>☾ Apogee . . . . . 22 18.0</div></div>				
1	4 45 37.45	2.2112	17 4 14.1	3.755					
2	4 47 50.22	2.2146	17 7 56.8	3.668					
3	4 50 3.20	2.2181	17 11 34.3	3.582					
4	4 52 16.39	2.2215	17 15 6.6	3.494					
5	4 54 29.78	2.2249	17 18 33.6	3.405					
6	4 56 43.38	2.2283	17 21 55.2	3.315					
7	4 58 57.18	2.2317	17 25 11.4	3.226					
8	5 1 11.18	2.2351	17 28 22.3	3.136					
9	5 3 25.39	2.2385	17 31 27.7	3.045					
10	5 5 39.80	2.2418	17 34 27.7	2.953					
11	5 7 54.41	2.2452	17 37 22.1	2.861					
12	5 10 9.23	2.2486	17 40 11.0	2.768					
13	5 12 24.24	2.2518	17 42 54.3	2.675					
14	5 14 39.45	2.2552	17 45 32.0	2.582					
15	5 16 54.86	2.2584	17 48 4.1	2.488					
16	5 19 10.46	2.2617	17 50 30.5	2.392					
17	5 21 26.26	2.2649	17 52 51.1	2.296					
18	5 23 42.25	2.2681	17 55 6.0	2.200					
19	5 25 58.43	2.2713	17 57 15.1	2.103					
20	5 28 14.81	2.2745	17 59 18.4	2.007					
21	5 30 31.37	2.2776	18 1 15.9	1.909					
22	5 32 48.12	2.2807	18 3 7.5	1.810					
23	5 35 5.06	2.2838	18 4 53.1	1.712					
24	5 37 22.18	2.2869	N.18 6 32.9	1.613					

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	III <sup>h</sup>	P. L. of Diff.	VI <sup>h</sup>	P. L. of Diff.	IX <sup>h</sup>	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
1	SATURN W.	93 19 30	2844	94 53 1	2831	96 26 48	2820	98 0 50	2807
	Fomalhaut W.	76 13 8	3219	77 38 55	3204	79 5 0	3188	80 31 24	3172
	α Pegasi W.	61 18 22	3195	62 44 37	3175	64 11 16	3154	65 38 20	3134
	JUPITER W.	19 47 0	2863	21 20 6	2849	22 53 30	2834	24 27 14	2819
	Pollux E.	63 16 24	2960	61 45 21	2952	60 14 8	2942	58 42 43	2934
	SUN E.	108 59 49	3207	107 33 48	3194	106 7 32	3181	104 41 0	3167
2	SATURN W.	105 55 15	2740	107 31 2	2726	109 7 7	2711	110 43 32	2696
	Fomalhaut W.	87 48 8	3095	89 16 24	3079	90 44 59	3065	92 13 52	3051
	α Pegasi W.	72 59 48	3035	74 29 17	3016	75 59 10	2997	77 29 26	2978
	JUPITER W.	32 20 41	2745	33 56 21	2721	35 32 22	2713	37 8 44	2698
	Pollux E.	51 2 51	2891	49 30 20	2883	47 57 40	2876	46 24 50	2869
	SUN E.	97 24 3	3093	95 55 45	3077	94 27 7	3061	92 58 10	3044
3	Fomalhaut W.	99 42 36	2981	101 13 12	2969	102 44 3	2957	104 15 10	2946
	α Pegasi W.	85 6 36	2887	86 39 11	2870	88 12 8	2852	89 45 28	2835
	JUPITER W.	45 15 58	2615	46 54 32	2598	48 33 30	2580	50 12 52	2563
	α Arietis W.	41 29 52	2921	43 1 44	2886	44 34 21	2853	46 7 40	2821
	SUN E.	85 28 10	2958	83 57 4	2940	82 25 36	2921	80 53 44	2903
4	α Pegasi W.	97 37 37	2753	99 13 7	2738	100 48 57	2722	102 25 7	2707
	JUPITER W.	58 35 48	2473	60 17 39	2455	61 59 55	2437	63 42 37	2419
	α Arietis W.	54 4 1	2681	55 41 7	2656	57 18 46	2630	58 57 0	2605
	Aldebaran W.	19 53 6	2486	21 34 39	2468	23 16 37	2450	24 59 1	2432
	SUN E.	73 8 25	2808	71 34 7	2788	69 59 23	2769	68 24 14	2749
5	JUPITER W.	72 22 40	2327	74 8 0	2309	75 53 46	2291	77 39 58	2274
	α Arietis W.	67 16 21	2491	68 57 47	2470	70 39 43	2448	72 22 9	2428
	Aldebaran W.	33 37 27	2341	35 22 27	2324	37 7 52	2306	38 53 43	2287
	SUN E.	60 22 1	2652	58 44 16	2632	57 6 5	2614	55 27 29	2594
6	JUPITER W.	86 37 25	2188	88 26 10	2172	90 15 20	2156	92 4 54	2141
	α Arietis W.	81 1 20	2334	82 46 30	2316	84 32 6	2300	86 18 6	2285
	Aldebaran W.	47 49 27	2203	49 37 50	2186	51 26 38	2171	53 15 49	2155
	SUN E.	47 8 0	2504	45 26 52	2486	43 45 19	2469	42 3 22	2453
7	JUPITER W.	101 18 22	2070	103 10 7	2058	105 2 11	2046	106 54 34	2034
	α Arietis W.	95 13 35	2215	97 1 40	2203	98 50 3	2193	100 38 41	2183
	Aldebaran W.	62 27 25	2085	64 18 47	2072	66 10 29	2061	68 2 29	2050
	SUN E.	33 28 3	2378	31 43 56	2364	29 59 30	2351	28 14 45	2339
11	SUN W.	23 15 23	2331	25 0 38	2342	26 45 37	2354	28 30 18	2366
	α Aquilæ E.	105 23 56	2510	103 42 57	2515	102 2 4	2520	100 21 19	2527
12	SUN W.	37 8 47	2441	38 51 24	2457	40 33 38	2473	42 15 29	2490
	α Aquilæ E.	92 0 31	2582	90 21 11	2596	88 42 11	2612	87 3 33	2630
	SATURN E.	109 9 47	2139	107 19 47	2154	105 30 10	2169	103 40 56	2185
13	SUN W.	50 38 33	2582	52 17 53	2600	53 56 48	2619	55 35 17	2639
	α Aquilæ E.	78 56 48	2735	77 20 54	2758	75 45 31	2783	74 10 41	2810
	SATURN E.	94 40 52	2269	92 54 7	2287	91 7 48	2304	89 21 55	2322
	Fomalhaut E.	111 47 48	2671	110 10 29	2680	108 33 22	2690	106 56 29	2702



## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XV <sup>h</sup>	P. L. of Diff.	XVIII <sup>h</sup>	P. L. of Diff.	XXI <sup>h</sup>	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
1	SATURN W.	99 35 9	2795	101 9 44	2781	102 44 37	2769	104 19 47	2754
	Fomalhaut W.	81 58 7	3156	83 25 9	3140	84 52 30	3124	86 20 10	3110
	α Pegasi W.	67 5 49	3114	68 33 42	3093	70 2 0	3073	71 30 42	3054
	JUPITER W.	26 1 17	2805	27 35 39	2790	29 10 20	2775	30 45 20	2760
	Pollux E.	57 11 7	2924	55 39 19	2916	54 7 21	2907	52 35 11	2899
	SUN E.	103 14 11	3153	101 47 6	3138	100 19 43	3124	98 52 2	3109
2	SATURN W.	112 20 17	2681	113 57 22	2666	115 34 47	2651	117 12 33	2634
	Fomalhaut W.	93 43 2	3036	95 12 30	3022	96 42 15	3009	98 12 17	2995
	α Pegasi W.	79 0 6	2960	80 31 9	2942	82 2 35	2924	83 34 24	2905
	JUPITER W.	38 45 27	2681	40 22 32	2666	41 59 58	2649	43 37 47	2632
	Pollux E.	44 51 52	2863	43 18 46	2858	41 45 33	2854	40 12 15	2831
	SUN E.	91 28 52	3028	89 59 14	3010	88 29 14	2993	86 58 53	2976
3	Fomalhaut W.	105 46 31	2934	107 18 7	2923	108 49 57	2913	110 21 59	2904
	α Pegasi W.	91 19 10	2818	92 53 14	2801	94 27 40	2785	96 2 28	2769
	JUPITER W.	51 52 38	2515	53 32 48	2527	55 13 23	2510	56 54 23	2492
	α Arietis W.	47 41 40	2792	49 16 19	2763	50 51 36	2735	52 27 30	2707
	SUN E.	79 21 29	2884	77 48 50	2865	76 15 46	2846	74 42 18	2827
4	α Pegasi W.	104 1 37	2693	105 38 26	2681	107 15 32	2568	108 52 55	2655
	JUPITER W.	65 25 45	2401	67 9 19	2382	68 53 20	2364	70 37 47	2346
	α Arietis W.	60 35 48	2582	62 15 8	2558	63 55 1	2535	65 35 25	2512
	Aldebaran W.	26 41 50	2414	28 25 5	2396	30 8 46	2378	31 52 53	2359
	SUN E.	66 48 39	2730	65 12 39	2710	63 36 12	2691	61 59 20	2671
5	JUPITER W.	79 26 36	2256	81 13 40	2239	83 1 10	2222	84 49 5	2205
	α Arietis W.	74 5 4	2408	75 48 27	2389	77 32 18	2370	79 16 36	2352
	Aldebaran W.	40 40 1	2270	42 26 45	2253	44 13 54	2236	46 1 28	2219
	SUN E.	53 48 26	2575	52 8 57	2557	50 29 3	2539	48 48 44	2521
6	JUPITER W.	93 54 51	2126	95 45 11	2111	97 35 53	2097	99 26 57	2083
	α Arietis W.	88 4 28	2268	89 51 14	2254	91 38 21	2241	93 25 48	2227
	Aldebaran W.	55 5 24	2140	56 55 22	2126	58 45 42	2112	60 36 23	2098
	SUN E.	40 21 3	2437	38 38 21	2421	36 55 16	2406	35 11 50	2391
7	JUPITER W.	108 47 15	2024	110 40 12	2013	112 33 26	2004	114 26 54	1995
	α Arietis W.	102 27 34	2174	104 16 40	2167	106 5 57	2160	107 55 25	2153
	Aldebaran W.	69 54 46	2039	71 47 20	2028	73 40 11	2019	75 33 16	2010
	SUN E.	26 29 43	2328	24 44 24	2317	22 58 49	2307	21 12 59	2299
11	SUN W.	30 14 41	2380	31 58 44	2395	33 42 26	2410	35 25 47	2424
	α Aquilæ E.	98 40 43	2535	97 0 18	2545	95 20 7	2556	93 40 11	2567
12	SUN W.	43 56 56	2508	45 37 58	2526	47 18 35	2544	48 58 47	2563
	α Aquilæ E.	85 25 19	2649	83 47 30	2669	82 10 8	2689	80 33 13	2711
	SATURN E.	101 52 6	2201	100 3 40	2218	98 15 39	2235	96 28 3	2251
13	SUN W.	57 13 19	2559	58 50 54	2678	60 28 4	2698	62 4 47	2717
	α Aquilæ E.	72 36 26	2837	71 2 46	2866	69 29 44	2896	67 57 20	2927
	SATURN E.	87 36 27	2340	85 51 26	2359	84 6 53	2377	82 22 45	2396
	Fomalhaut E.	105 19 52	2714	103 43 31	2728	102 7 28	2741	100 31 43	2756

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
14	SUN	W.	63 41 4	2738	65 16 54	2757	66 52 18	2777	68 27 16	2797
	Spica	W.	32 59 50	2473	34 41 41	2487	36 23 12	2502	38 4 23	2517
	α Aquilæ	E.	66 25 35	2959	64 54 31	2993	63 24 9	3028	61 54 31	3065
	SATURN	E.	80 39 4	2414	78 55 49	2433	77 13 2	2451	75 30 40	2470
	Fomalhaut	E.	98 56 17	2771	97 21 11	2786	95 46 25	2802	94 12 0	2820
	α Pegasi	E.	113 48 55	2731	112 12 56	2741	110 37 11	2753	109 1 42	2766
15	SUN	W.	76 15 43	2894	77 48 10	2913	79 20 12	2931	80 51 51	2950
	Spica	W.	46 24 57	2596	48 3 58	2612	49 42 37	2627	51 20 55	2643
	α Aquilæ	E.	54 38 19	3277	53 13 41	3226	51 50 0	3379	50 27 19	3433
	SATURN	E.	67 5 17	2561	65 25 28	2580	63 46 5	2596	62 7 5	2614
	Fomalhaut	E.	86 25 36	2910	84 53 30	2930	83 21 49	2949	81 50 32	2969
	α Pegasi	E.	101 8 32	2835	99 34 49	2850	98 1 26	2865	96 28 22	2880
16	SUN	W.	88 24 20	3039	89 53 44	3057	91 22 46	3073	92 51 28	3089
	Spica	W.	59 27 5	2721	61 3 17	2736	62 39 9	2750	64 14 42	2766
	α Aquilæ	E.	43 50 40	3772	42 35 9	3856	41 21 5	3947	40 8 33	4046
	SATURN	E.	53 58 0	2699	52 21 19	2716	50 45 1	2732	49 9 3	2748
	Fomalhaut	E.	74 20 36	3075	72 51 56	3098	71 23 44	3120	69 55 59	3143
	α Pegasi	E.	88 48 4	2961	87 17 2	2977	85 46 20	2993	84 15 58	3009
17	SUN	W.	100 10 11	3166	101 37 1	3180	103 3 34	3193	104 29 51	3207
	Spica	W.	72 7 46	2834	73 41 30	2846	75 14 58	2859	76 48 10	2871
	Antares	W.	27 38 21	3111	29 5 17	3098	30 34 29	3087	32 2 55	3078
	SATURN	E.	41 14 28	2825	39 40 32	2840	38 6 56	2855	36 33 39	2869
	Fomalhaut	E.	62 44 20	3266	61 19 29	3294	59 55 10	3321	58 31 23	3350
	α Pegasi	E.	76 49 19	3094	75 21 2	3110	73 53 5	3128	72 25 29	3145
	JUPITER	E.	114 35 40	2788	113 0 56	2800	111 26 28	2813	109 52 17	2825
18	SUN	W.	111 37 24	3269	113 2 12	3279	114 26 48	3290	115 51 11	3300
	Spica	W.	84 30 25	2927	86 2 10	2937	87 33 42	2946	89 5 2	2955
	Antares	W.	39 26 44	3066	40 55 35	3066	42 24 26	3067	43 53 16	3069
	Fomalhaut	E.	51 41 5	3512	50 20 54	3550	49 1 25	3589	47 42 39	3632
	α Pegasi	E.	65 12 45	3235	63 47 17	3253	62 22 11	3272	60 57 27	3293
	JUPITER	E.	102 5 6	2880	100 32 21	2991	98 59 50	2899	97 27 30	2909
	α Arietis	E.	108 17 13	3052	106 48 4	3059	105 19 4	3067	103 50 14	3075
19	Spica	W.	96 38 56	2997	98 9 12	3005	99 39 19	3011	101 9 18	3018
	Antares	W.	51 16 37	3084	52 45 6	3087	54 13 32	3090	55 41 54	3092
	Fomalhaut	E.	41 21 14	3895	40 7 49	3962	38 55 32	4035	37 44 27	4114
	α Pegasi	E.	53 59 47	3401	52 37 32	3425	51 15 44	3451	49 54 25	3479
	JUPITER	E.	89 48 38	2949	88 17 21	2956	86 46 13	2962	85 15 13	2970
	α Arietis	E.	96 28 21	3110	95 0 24	3117	93 32 35	3124	92 4 54	3129
20	Spica	W.	108 37 12	3047	110 6 26	3052	111 35 34	3057	113 4 36	3061
	Antares	W.	63 2 47	3108	64 30 47	3111	65 58 43	3113	67 26 37	3115
	α Pegasi	E.	43 16 5	3645	41 58 19	3686	40 41 17	3731	39 25 3	3781
	JUPITER	E.	77 42 9	2997	76 11 52	3001	74 41 40	3005	73 11 33	3009
	α Arietis	E.	84 48 18	3158	83 21 19	3164	81 54 27	3169	80 27 41	3174
21	Antares	W.	74 45 27	3125	76 13 6	3126	77 40 44	3128	79 8 20	3129
	JUPITER	E.	65 42 4	3024	64 12 21	3026	62 42 40	3028	61 13 2	3030

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
14	SUN W.	70 1 48	2817	71 35 54	2836	73 9 35	2855	74 42 51	2874
	Spica W.	39 45 13	2533	41 25 41	2548	43 5 48	2564	44 45 33	2579
	α Aquilæ E.	60 25 39	3104	58 57 34	3144	57 30 18	3186	56 3 53	3230
	SATURN E.	73 48 44	2488	72 7 14	2507	70 26 10	2525	68 45 31	2543
	Fomalhaut E.	92 37 58	2837	91 4 18	2855	89 31 1	2873	87 58 7	2891
	α Pegasi E.	107 26 29	2779	105 51 33	2792	104 16 55	2805	102 42 34	2820
15	SUN W.	82 23 6	2969	83 53 58	2987	85 24 27	3005	86 54 34	3022
	Spica W.	52 58 52	2659	54 36 27	2675	56 13 40	2690	57 50 33	2706
	α Aquilæ E.	49 5 40	3492	47 45 7	3555	46 25 43	3623	45 7 33	3694
	SATURN E.	60 28 29	2632	58 50 17	2649	57 12 29	2666	55 35 3	2683
	Fomalhaut E.	80 19 41	2990	78 49 16	3010	77 19 16	3032	75 49 43	3053
	α Pegasi E.	94 55 38	2896	93 23 14	2912	91 51 11	2927	90 19 27	2944
16	SUN W.	94 19 51	3105	95 47 54	3121	97 15 38	3137	98 43 3	3151
	Spica W.	65 49 55	2779	67 24 50	2794	68 59 26	2807	70 33 45	2821
	α Aquilæ E.	38 57 39	4155	37 48 30	4276	36 41 15	4408	35 36 1	4554
	SATURN E.	47 33 27	2764	45 58 12	2779	44 23 17	2795	42 48 43	2810
	Fomalhaut E.	68 28 41	3167	67 1 52	3191	65 35 32	3215	64 9 41	3241
	α Pegasi E.	82 45 57	3026	81 16 16	3043	79 46 57	3060	78 17 58	3076
17	SUN W.	105 55 52	3220	107 21 37	3233	108 47 7	3246	110 12 22	3257
	Spica W.	78 21 6	2883	79 53 47	2894	81 26 14	2905	82 58 26	2916
	Antares W.	33 31 31	3073	35 0 14	3069	36 29 2	3066	37 57 53	3066
	SATURN E.	35 0 41	2884	33 28 2	2899	31 55 42	2913	30 23 40	2928
	Fomalhaut E.	57 8 9	3379	55 45 29	3410	54 23 24	3443	53 1 56	3476
	α Pegasi E.	70 58 14	3163	69 31 20	3180	68 4 47	3198	66 38 35	3216
	JUPITER E.	108 18 21	2837	106 44 41	2848	105 11 15	2859	103 38 4	2869
18	SUN W.	117 15 22	3311	118 39 21	3329	120 3 10	3329	121 26 48	3338
	Spica W.	90 36 11	2965	92 7 8	2973	93 37 54	2981	95 8 30	2989
	Antares W.	45 22 3	3072	46 50 47	3075	48 19 27	3078	49 48 4	3081
	Fomalhaut E.	46 24 39	3677	45 7 27	3726	43 51 7	3777	42 35 41	3834
	α Pegasi E.	59 33 7	3313	58 9 10	3333	56 45 37	3355	55 22 29	3378
	JUPITER E.	95 55 22	2918	94 23 26	2926	92 51 40	2934	91 20 4	2942
	α Arietis E.	102 21 34	3082	100 53 3	3089	99 24 40	3096	97 56 26	3104
19	Spica W.	102 39 8	3025	104 8 50	3031	105 38 24	3037	107 7 51	3042
	Antares W.	57 10 13	3096	58 38 27	3100	60 6 37	3102	61 34 44	3105
	Fomalhaut E.	36 34 39	4203	35 26 16	4304	34 19 27	4414	33 14 18	4534
	α Pegasi E.	48 33 37	3507	47 13 21	3538	45 53 39	3571	44 34 33	3606
	JUPITER E.	83 44 22	2975	82 13 38	2981	80 43 2	2986	79 12 32	2992
	α Arietis E.	90 37 20	3136	89 9 54	3142	87 42 35	3148	86 15 23	3153
20	Spica W.	114 33 33	3066	116 2 24	3069	117 31 11	3073	118 59 54	3076
	Antares W.	68 54 28	3118	70 22 16	3119	71 50 2	3121	73 17 46	3124
	α Pegasi E.	38 9 41	3835	36 55 15	3894	35 41 49	3961	34 29 31	4039
	JUPITER E.	71 41 31	3012	70 11 33	3016	68 41 40	3018	67 11 50	3022
	α Arietis E.	79 1 1	3180	77 34 28	3184	76 8 0	3189	74 41 38	3193
21	Antares W.	80 35 55	3129	82 3 29	3130	83 31 2	3131	84 58 34	3132
	JUPITER E.	59 43 26	3031	58 13 52	3032	56 44 19	3033	55 14 47	3034

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
21	$\alpha$ Arietis E.	73 15 21	3198	71 49 10	3204	70 23 5	3209	68 57 6	3213
	Aldebaran E.	105 39 55	3058	104 10 54	3060	102 41 55	3061	101 12 58	3063
22	Antares W.	86 26 5	3132	87 53 36	3133	89 21 6	3133	90 48 36	3133
	$\alpha$ Aquilæ W.	43 2 34	4121	44 12 15	4066	45 22 50	4017	46 34 13	3971
	JUPITER E.	53 45 17	3035	52 15 48	3035	50 46 19	3035	49 16 50	3035
	$\alpha$ Arietis E.	61 48 33	3237	60 23 8	3243	58 57 50	3248	57 32 38	3254
	Aldebaran E.	93 48 40	3069	92 19 52	3069	90 51 5	3069	89 22 18	3069
23	Antares W.	98 6 10	3131	99 33 42	3130	101 1 15	3129	102 28 49	3129
	$\alpha$ Aquilæ W.	52 41 24	3792	53 56 34	3765	55 12 13	3738	56 28 20	3714
	SATURN W.	31 40 44	3090	33 9 6	3086	34 37 32	3082	36 6 4	3078
	JUPITER E.	41 49 22	3033	40 19 50	3032	38 50 17	3031	37 20 43	3029
	$\alpha$ Arietis E.	50 28 33	3291	49 4 11	3300	47 39 59	3310	46 15 59	3321
	Aldebaran E.	81 58 15	3066	80 29 24	3065	79 0 32	3063	77 31 37	3062
24	Antares W.	109 46 53	3124	111 14 33	3124	112 42 14	3122	114 9 57	3121
	$\alpha$ Aquilæ W.	62 54 48	3614	64 13 7	3598	65 31 43	3582	66 50 37	3567
	SATURN W.	43 29 49	3060	44 58 47	3057	46 27 49	3053	47 56 56	3050
	JUPITER E.	29 52 26	3022	28 22 41	3021	26 52 54	3019	25 23 5	3018
	$\alpha$ Arietis E.	39 19 41	3398	37 57 22	3419	36 35 27	3443	35 13 59	3470
	Aldebaran E.	70 6 34	3052	68 37 26	3050	67 8 15	3047	65 39 0	3044
	Pollux E.	113 29 6	3149	112 1 56	3144	110 34 40	3139	109 7 18	3135
25	$\alpha$ Aquilæ W.	73 28 48	3506	74 49 5	3496	76 9 34	3486	77 30 14	3477
	SATURN W.	55 23 39	3030	56 53 14	3026	58 22 54	3022	59 52 40	3018
	Aldebaran E.	58 11 52	3028	56 42 14	3024	55 12 31	3020	53 42 43	3017
	Pollux E.	101 49 8	3113	100 21 14	3109	98 53 15	3104	97 25 10	3099
26	$\alpha$ Aquilæ W.	84 15 59	3437	85 37 34	3431	86 59 16	3424	88 21 6	3418
	SATURN W.	67 22 53	2994	68 53 13	2989	70 23 40	2984	71 54 13	2978
	Aldebaran E.	46 12 29	2994	44 42 9	2989	43 11 43	2984	41 41 10	2979
	Pollux E.	90 3 20	3076	88 34 41	3071	87 5 56	3066	85 37 5	3060
27	$\alpha$ Aquilæ W.	95 11 44	3394	96 34 7	3391	97 56 34	3388	99 19 5	3385
	SATURN W.	79 28 45	2949	81 0 2	2942	82 31 27	2936	84 3 0	2929
	Aldebaran E.	34 6 46	2950	32 35 31	2943	31 4 7	2937	29 32 35	2931
	Pollux E.	78 11 17	3035	76 41 48	3030	75 12 13	3025	73 42 31	3019
	Regulus E.	114 12 13	2954	112 41 3	2948	111 9 45	2941	109 38 18	2934
28	SATURN W.	91 42 58	2893	93 15 26	2885	94 48 4	2877	96 20 52	2869
	Pollux E.	66 12 22	2993	64 42 0	2987	63 11 31	2982	61 40 55	2977
	Regulus E.	101 58 48	2898	100 26 26	2889	98 53 53	2881	97 21 10	2873
29	SATURN W.	104 7 38	2825	105 41 34	2815	107 15 43	2805	108 50 5	2795
	Pollux E.	54 6 19	2951	52 35 5	2947	51 3 45	2943	49 32 21	2939
	Regulus E.	89 34 45	2827	88 0 52	2818	86 26 47	2807	84 52 28	2796
	SUN E.	126 46 31	3178	125 19 56	3168	123 53 9	3157	122 26 9	3146
30	Pollux E.	41 54 24	2931	40 22 44	2932	38 51 6	2935	37 19 31	2939
	Regulus E.	76 57 24	2741	75 21 39	2729	73 45 39	2717	72 9 22	2705
	SUN E.	115 7 39	3087	113 39 13	3074	112 10 32	3060	110 41 34	3047

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
21	$\alpha$ Arietis	E.	67 31 12	3218	66 5 24	3222	64 39 41	3227	63 14 4	3232
	Aldebaran	E.	99 44 3	3065	98 15 10	3066	96 46 19	3067	95 17 29	3068
22	Antares	W.	92 16 6	3133	93 43 36	3132	95 11 7	3132	96 38 38	3131
	$\alpha$ Aquilæ	W.	47 46 21	3929	48 59 11	3891	50 12 40	3856	51 26 45	3822
	JUPITER	E.	47 47 21	3035	46 17 52	3035	44 48 23	3034	43 18 53	3034
	$\alpha$ Arietis	E.	56 7 33	3261	54 42 36	3267	53 17 46	3275	51 53 5	3282
	Aldebaran	E.	87 53 30	3069	86 24 42	3069	84 55 54	3068	83 27 5	3067
23	Antares	W.	103 56 24	3128	105 24 0	3127	106 51 36	3126	108 19 14	3125
	$\alpha$ Aquilæ	W.	57 44 52	3692	59 1 48	3670	60 19 7	3650	61 36 47	3631
	SATURN	W.	37 34 40	3075	39 3 20	3071	40 32 5	3067	42 0 55	3064
	JUPITER	E.	35 51 7	3028	34 21 29	3027	32 51 50	3026	31 22 9	3024
	$\alpha$ Arietis	E.	44 52 12	3333	43 28 39	3347	42 5 22	3362	40 42 22	3379
	Aldebaran	E.	76 2 41	3060	74 33 43	3058	73 4 43	3056	71 35 40	3054
24	Antares	W.	115 37 41	3120	117 5 26	3120	118 33 11	3118	120 0 58	3116
	$\alpha$ Aquilæ	W.	68 9 47	3554	69 29 12	3542	70 48 50	3529	72 8 42	3517
	SATURN	W.	49 26 7	3046	50 55 23	3042	52 24 43	3038	53 54 9	3034
	JUPITER	E.	23 53 14	3017	22 23 22	3015	20 53 28	3014	19 23 32	3012
	$\alpha$ Arietis	E.	33 53 1	3501	32 32 38	3538	31 12 56	3580	29 54 0	3627
	Aldebaran	E.	64 9 42	3041	62 40 20	3038	61 10 55	3035	59 41 26	3031
	Pollux	E.	107 39 50	3131	106 12 18	3126	104 44 40	3122	103 16 57	3117
25	$\alpha$ Aquilæ	W.	78 51 4	3468	80 12 4	3460	81 33 13	3451	82 54 32	3444
	SATURN	W.	61 22 31	3013	62 52 28	3009	64 22 30	3004	65 52 38	2998
	Aldebaran	E.	52 12 51	3013	50 42 54	3008	49 12 51	3004	47 42 43	2999
	Pollux	E.	95 56 59	3095	94 28 43	3090	93 0 21	3085	91 31 53	3081
26	$\alpha$ Aquilæ	W.	89 43 2	3413	91 5 4	3408	92 27 12	3403	93 49 26	3399
	SATURN	W.	73 24 53	2973	74 55 40	2967	76 26 34	2961	77 57 36	2955
	Aldebaran	E.	40 10 31	2974	38 39 45	2968	37 8 53	2962	35 37 53	2957
	Pollux	E.	84 8 7	3056	82 39 4	3051	81 9 55	3046	79 40 39	3041
27	$\alpha$ Aquilæ	W.	100 41 39	3383	102 4 15	3381	103 26 54	3379	104 49 34	3378
	SATURN	W.	85 34 42	2923	87 6 32	2916	88 38 31	2908	90 10 40	2901
	Aldebaran	E.	28 0 55	2924	26 29 6	2917	24 57 9	2909	23 25 2	2901
	Pollux	E.	72 12 42	3014	70 42 47	3009	69 12 45	3004	67 42 37	2998
	Regulus	E.	108 6 42	2927	106 34 57	2920	105 3 4	2912	103 31 1	2905
28	SATURN	W.	97 53 51	2860	99 27 1	2851	101 0 21	2842	102 33 54	2834
	Pollux	E.	60 10 13	2971	58 39 24	2966	57 8 29	2961	55 37 27	2956
	Regulus	E.	95 48 16	2864	94 15 11	2855	92 41 54	2846	91 8 26	2836
29	SATURN	W.	110 24 40	2785	111 59 28	2774	113 34 30	2763	115 9 46	2753
	Pollux	E.	48 0 52	2936	46 29 19	2934	44 57 43	2932	43 26 4	2931
	Regulus	E.	83 17 55	2786	81 43 9	2775	80 8 9	2764	78 32 54	2753
	SUN	E.	120 58 55	3135	119 31 28	3123	118 3 46	3111	116 35 50	3099
30	Pollux	E.	35 48 2	2946	34 16 42	2957	32 45 35	2969	31 14 43	2983
	Regulus	E.	70 32 49	2692	68 55 59	2680	67 18 53	2667	65 41 29	2655
	SUN	E.	109 12 20	3034	107 42 49	3020	106 13 1	3005	104 42 55	2991

## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S						Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.		Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.					
		h m s	s	° ' "	"	' "	s	m s	s		
Sat.	1	12 28 52.04	9.052	S. 3 7 8.8	-58.25	16 0.81	64.31	10 15.40	0.802		
SUN.	2	12 32 29.44	9.065	3 30 25.9	58.17	16 1.08	64.35	10 34.49	0.789		
Mon.	3	12 36 7.18	9.080	3 53 40.8	58.07	16 1.35	64.40	10 53.26	0.775		
Tues.	4	12 39 45.26	9.094	4 16 53.1	-57.95	16 1.62	64.45	11 11.68	0.760		
Wed.	5	12 43 23.70	9.110	4 40 2.4	57.82	16 1.89	64.50	11 29.74	0.745		
Thur.	6	12 47 2.53	9.126	5 3 8.4	57.67	16 2.17	64.55	11 47.42	0.728		
Frid.	7	12 50 41.76	9.143	5 26 10.6	-57.51	16 2.44	64.61	12 4.69	0.711		
Sat.	8	12 54 21.40	9.161	5 49 8.8	57.33	16 2.72	64.67	12 21.55	0.694		
SUN.	9	12 58 1.48	9.179	6 12 2.5	57.14	16 2.99	64.74	12 37.98	0.675		
Mon.	10	1 13 1 42.00	9.198	6 34 51.3	-56.92	16 3.27	64.81	12 53.97	0.656		
Tues.	11	1 13 5 22.98	9.217	6 57 34.8	56.70	16 3.56	64.88	1 3 9.50	0.637		
Wed.	12	1 13 9 4.43	9.237	7 20 12.7	56.45	16 3.83	64.95	1 24.56	0.617		
Thur.	13	1 13 12 46.37	9.258	7 42 44.5	-56.19	16 4.11	65.03	1 39.12	0.597		
Frid.	14	1 13 16 28.82	9.280	8 5 9.8	55.91	16 4.39	65.11	1 53.18	0.576		
Sat.	15	1 13 20 11.79	9.302	8 27 28.3	55.62	16 4.68	65.19	2 6.73	0.554		
SUN.	16	1 13 23 55.30	9.325	8 49 39.6	-55.31	16 4.96	65.27	2 19.75	0.531		
Mon.	17	1 13 27 39.37	9.348	9 11 43.3	54.99	16 5.24	65.36	2 32.20	0.507		
Tues.	18	1 13 31 24.01	9.372	9 33 39.0	54.65	16 5.52	65.44	2 44.07	0.482		
Wed.	19	1 13 35 9.25	9.397	9 55 26.4	-54.29	16 5.79	65.53	2 55.35	0.457		
Thur.	20	1 13 38 55.10	9.423	10 17 4.9	53.92	16 6.06	65.62	3 6.03	0.432		
Frid.	21	1 13 42 41.58	9.450	10 38 34.4	53.53	16 6.34	65.71	3 16.08	0.405		
Sat.	22	1 13 45 28.71	9.478	10 59 54.3	-53.12	16 6.61	65.81	3 25.47	0.377		
SUN.	23	1 13 50 16.52	9.506	11 21 4.4	52.71	16 6.88	65.91	3 34.20	0.349		
Mon.	24	1 13 54 5.00	9.535	11 42 4.2	52.27	16 7.14	66.01	3 42.24	0.320		
Tues.	25	1 13 57 54.20	9.565	12 2 53.2	-51.81	16 7.41	66.12	3 49.58	0.291		
Wed.	26	1 14 1 44.11	9.595	12 23 31.3	51.34	16 7.67	66.23	3 56.21	0.261		
Thur.	27	1 14 5 34.76	9.626	12 43 57.9	50.86	16 7.93	66.34	4 2.09	0.230		
Frid.	28	1 14 9 26.17	9.658	13 4 12.6	-50.36	16 8.18	66.44	4 7.22	0.198		
Sat.	29	1 14 13 18.34	9.690	13 24 15.2	49.85	16 8.43	66.55	4 11.58	0.165		
SUN.	30	1 14 17 11.31	9.723	13 44 5.2	49.31	16 8.68	66.66	4 15.16	0.133		
Mon.	31	1 14 21 5.07	9.757	14 3 42.2	48.76	16 8.93	66.77	4 17.95	0.099		
Tues.	32	1 14 24 59.64	9.791	S. 14 23 5.7	-48.19	16 9.17	66.88	4 19.93	0.065		

NOTE.—The mean time of semidiameter passing the meridian may be found by subtracting 0<sup>s</sup>.18 from the sidereal time.  
The sign — prefixed to the hourly change of declination indicates that south declinations are increasing.

## AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ' "	"	m s	s	h m s
Sat.	1	12 28 53.58	9.054	S. 3 7 18.7	-58.27	10 15.54	0.802	12 39 9.12
SUN.	2	12 32 31.04	9.067	3 30 36.2	58.18	10 34.63	0.789	12 43 5.67
Mon.	3	12 36 8.82	9.081	3 53 51.3	58.08	10 53.40	0.775	12 47 2.22
Tues.	4	12 39 46.95	9.096	4 17 3.9	-57.96	11 11.82	0.760	12 50 58.77
Wed.	5	12 43 25.45	9.112	4 40 13.5	57.83	11 29.88	0.745	12 54 55.33
Thur.	6	12 47 4.32	9.128	5 3 19.7	57.68	11 47.56	0.728	12 58 51.88
Frid.	7	12 50 43.60	9.145	5 26 22.2	-57.52	12 4.83	0.711	13 2 48.43
Sat.	8	12 54 23.29	9.163	5 49 20.6	57.34	12 21.69	0.693	13 6 44.98
SUN.	9	12 58 3.41	9.181	6 12 14.5	57.15	12 38.12	0.675	13 10 41.54
Mon.	10	13 1 43.98	9.200	6 35 3.5	-56.94	12 54.11	0.657	13 14 38.09
Tues.	11	13 5 25.00	9.219	6 57 47.2	56.71	13 9.64	0.638	13 18 34.64
Wed.	12	13 9 6.50	9.239	7 20 25.3	56.46	13 24.70	0.618	13 22 31.19
Thur.	13	13 12 48.48	9.260	7 42 57.3	-56.20	13 39.27	0.597	13 26 27.74
Frid.	14	13 16 30.97	9.281	8 5 22.8	55.92	13 53.33	0.575	13 30 24.30
Sat.	15	13 20 13.98	9.303	8 27 41.4	55.63	14 6.87	0.553	13 34 20.85
SUN.	16	13 23 57.53	9.326	8 49 52.9	-55.32	14 19.88	0.530	13 38 17.40
Mon.	17	13 27 41.63	9.350	9 11 56.6	54.99	14 32.32	0.507	13 42 13.95
Tues.	18	13 31 26.31	9.374	9 33 52.4	54.65	14 44.19	0.482	13 46 10.51
Wed.	19	13 35 11.59	9.399	9 55 39.9	-54.29	14 55.47	0.457	13 50 7.06
Thur.	20	13 38 57.47	9.425	10 17 18.5	53.92	15 6.14	0.432	13 54 3.61
Frid.	21	13 42 43.99	9.452	10 38 48.0	53.53	15 16.18	0.405	13 58 0.17
Sat.	22	13 46 31.15	9.479	11 0 8.0	-53.13	15 25.57	0.377	14 1 56.72
SUN.	23	13 50 18.98	9.507	11 21 18.0	52.71	15 34.29	0.349	14 5 53.27
Mon.	24	13 54 7.50	9.536	11 42 17.8	52.27	15 42.32	0.320	14 9 49.82
Tues.	25	13 57 56.72	9.566	12 3 6.9	-51.82	15 49.66	0.291	14 13 46.38
Wed.	26	14 1 46.66	9.596	12 23 44.9	51.35	15 56.28	0.261	14 17 42.93
Thur.	27	14 5 37.33	9.627	12 44 11.5	50.86	16 2.15	0.231	14 21 39.48
Frid.	28	14 9 28.76	9.659	13 4 26.2	-50.36	16 7.27	0.199	14 25 36.04
Sat.	29	14 13 20.96	9.691	13 24 28.7	49.84	16 11.63	0.166	14 29 32.59
SUN.	30	14 17 13.94	9.724	13 44 18.6	49.31	16 15.20	0.132	14 33 29.14
Mon.	31	14 21 7.72	9.758	14 3 55.4	48.76	16 17.98	0.099	14 37 25.70
Tues.	32	14 25 2.30	9.791	S. 14 23 18.9	-48.19	16 19.95	0.065	14 41 22.25

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.

The sign — prefixed to the hourly change of declination indicates that south declinations are increasing.

Diff. for 1 Hour,  
+ 9°.8565.  
(Table III.)

AT GREENWICH MEAN NOON.										
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.		
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.					
		$\lambda$	$\lambda'$							
1	275	187 52 17.1	51 43.8	147.60	— 0.31	0.000 3118	— 50.9	h m s	11 18 59.34	
2	276	188 51 20.7	50 47.3	147.70	0.26	0.000 1896	50.9	11 15 3.43		
3	277	189 50 26.6	49 53.2	147.80	0.19	0.000 0673	51.0	11 11 7.53		
4	278	190 49 34.9	49 1.4	147.89	— 0.09	9.999 9447	— 51.1	11 7 11.62		
5	279	191 48 45.5	48 11.9	147.99	+ 0.02	9.999 8218	51.3	11 3 15.72		
6	280	192 47 58.4	47 24.8	148.09	0.16	9.999 6985	51.5	10 59 19.81		
7	281	193 47 13.6	46 39.8	148.18	+ 0.31	9.999 5747	— 51.7	10 55 23.90		
8	282	194 46 31.0	45 57.1	148.27	0.47	9.999 4504	51.9	10 51 28.00		
9	283	195 45 50.5	45 16.5	148.35	0.60	9.999 3255	52.2	10 47 32.09		
10	284	196 45 12.0	44 38.0	148.44	+ 0.71	9.999 2000	— 52.4	10 43 36.18		
11	285	197 44 35.5	44 1.4	148.52	0.80	9.999 0740	52.6	10 39 40.28		
12	286	198 44 0.8	43 26.6	148.60	0.86	9.998 9477	52.7	10 35 44.37		
13	287	199 43 28.0	42 53.7	148.67	+ 0.89	9.998 8212	— 52.7	10 31 48.46		
14	288	200 42 57.0	42 22.6	148.74	0.89	9.998 6946	52.7	10 27 52.56		
15	289	201 42 27.7	41 53.3	148.82	0.87	9.998 5681	52.7	10 23 56.65		
16	290	202 42 0.2	41 25.7	148.89	+ 0.81	9.998 4419	— 52.5	10 20 0.75		
17	291	203 41 34.5	40 59.8	148.96	0.73	9.998 3161	52.3	10 16 4.84		
18	292	204 41 10.5	40 35.7	149.04	0.63	9.998 1909	52.0	10 12 8.93		
19	293	205 40 48.2	40 13.4	149.11	+ 0.51	9.998 0665	— 51.7	10 8 13.03		
20	294	206 40 27.8	39 52.8	149.19	0.39	9.997 9428	51.3	10 4 17.12		
21	295	207 40 9.2	39 34.2	149.26	0.26	9.997 8201	50.9	10 0 21.21		
22	296	208 39 52.5	39 17.3	149.34	+ 0.15	9.997 6985	— 50.5	9 56 25.30		
23	297	209 39 37.6	39 2.4	149.42	+ 0.04	9.997 5779	50.0	9 52 29.40		
24	298	210 39 24.6	38 49.3	149.50	— 0.06	9.997 4586	49.5	9 48 33.49		
25	299	211 39 13.7	38 38.2	149.58	— 0.14	9.997 3405	— 48.9	9 44 37.58		
26	300	212 39 4.7	38 29.1	149.67	0.20	9.997 2237	48.4	9 40 41.67		
27	301	213 38 57.8	38 22.1	149.76	0.22	9.997 1083	47.8	9 36 45.77		
28	302	214 38 53.0	38 17.2	149.85	— 0.22	9.996 9941	— 47.3	9 32 49.86		
29	303	215 38 50.3	38 14.4	149.93	0.19	9.996 8811	46.8	9 28 53.95		
30	304	216 38 49.8	38 13.8	150.02	0.13	9.996 7694	46.3	9 24 58.04		
31	305	217 38 51.4	38 15.3	150.11	— 0.03	9.996 6587	45.9	9 21 2.14		
32	306	218 38 55.2	38 19.0	150.20	+ 0.07	9.996 5491	— 45.5	9 17 6.23		

NOTE.—The longitudes in the column  $\lambda$  are referred to the true equinox of their own date, while those in the column  $\lambda'$  are referred to the mean equinox of the beginning of the Besselian fictitious year.

Diff. for 1 Hour.  
— 9°.8296.  
(Table II.)



## GREENWICH MEAN TIME.

## THE MOON'S

Day of the Month.	SEMI- DIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	"	"	"	"	"	"	h m	m	d
1	15 32.5	15 38.6	56 56.3	+ 1.82	57 18.8	+ 1.92	17 36.0	2.25	21.6
2	15 45.0	15 51.6	57 42.3	1.98	58 6.4	2.03	18 30.8	2.31	22.6
3	15 58.3	16 5.0	58 31.0	2.05	58 55.6	2.03	19 26.6	2.34	23.6
4	16 11.5	16 17.8	59 19.7	+ 1.96	59 42.8	+ 1.85	20 22.8	2.34	24.6
5	16 23.6	16 28.9	60 4.2	1.69	60 23.4	1.48	21 18.9	2.33	25.6
6	16 33.3	16 36.8	60 39.7	1.22	60 52.5	0.91	22 14.8	2.32	26.6
7	16 39.2	16 40.5	61 1.4	+ 0.56	61 6.0	+ 0.18	23 10.5	2.32	27.6
8	16 40.4	16 39.1	61 5.9	- 0.21	61 1.1	- 0.59	6		28.6
9	16 36.5	16 32.8	60 51.6	0.96	60 37.8	1.31	0 6.0	2.32	0.3
10	16 27.9	16 22.2	60 20.0	- 1.63	59 58.8	- 1.88	1 1.7	2.32	1.3
11	16 15.6	16 8.5	59 34.8	2.09	59 8.6	2.24	1 57.4	2.32	2.3
12	16 1.0	15 53.3	58 41.0	2.33	58 12.7	2.36	2 52.8	2.29	3.3
13	15 45.5	15 37.9	57 44.2	- 2.35	57 16.2	- 2.29	3 47.4	2.25	4.3
14	15 30.5	15 23.6	56 49.2	2.20	56 23.5	2.07	4 40.6	2.18	5.3
15	15 17.0	15 11.1	55 59.5	1.91	55 37.6	1.74	5 31.9	2.09	6.3
16	15 5.7	15 0.9	55 17.8	- 1.55	55 0.3	- 1.36	6 21.1	2.01	7.3
17	14 56.8	14 53.3	54 45.2	1.16	54 32.6	0.95	7 8.2	1.92	8.3
18	14 50.6	14 48.4	54 22.3	0.75	54 14.4	0.56	7 53.4	1.85	9.3
19	14 46.9	14 46.0	54 8.8	- 0.37	54 5.5	- 0.20	8 37.1	1.80	10.3
20	14 45.6	14 45.8	54 4.1	- 0.03	54 4.7	+ 0.12	9 19.9	1.77	11.3
21	14 46.4	14 47.5	54 7.1	+ 0.26	54 11.1	0.39	10 2.4	1.77	12.3
22	14 49.0	14 50.8	54 16.5	+ 0.51	54 23.3	+ 0.61	10 45.1	1.79	13.3
23	14 53.0	14 55.5	54 31.4	0.71	54 40.5	0.79	11 28.7	1.84	14.3
24	14 58.2	15 1.2	54 50.5	0.87	55 1.4	0.94	12 13.5	1.91	15.3
25	15 4.4	15 7.7	55 13.0	+ 1.00	55 25.4	+ 1.05	13 0.2	1.99	16.3
26	15 11.3	15 15.0	55 38.4	1.11	55 52.0	1.16	13 48.9	2.07	17.3
27	15 18.9	15 22.9	56 6.3	1.21	56 21.2	1.27	14 39.7	2.16	18.3
28	15 27.2	15 31.5	56 36.7	+ 1.31	56 52.8	+ 1.35	15 32.2	2.22	19.3
29	15 36.0	15 40.7	57 9.4	1.40	57 26.5	1.45	16 25.9	2.25	20.3
30	15 45.5	15 50.4	57 44.1	1.48	58 2.0	1.50	17 20.3	2.27	21.3
31	15 55.3	16 0.2	58 20.1	1.50	58 38.2	1.50	18 14.7	2.26	22.3
32	16 5.1	16 9.7	58 56.0	+ 1.46	59 13.1	+ 1.38	19 8.8	2.25	23.3

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 1.					MONDAY 3.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	5 37 22.18	2.2869	N.18 6 32.9	1.613	0	7 30 4.93	2.3953	N.17 22 20.1	3.553
1	5 39 39.49	2.2900	18 8 6.7	1.513	1	7 32 28.69	2.3966	17 18 43.6	3.664
2	5 41 56.98	2.2930	18 9 34.5	1.413	2	7 34 52.52	2.3978	17 15 0.4	3.775
3	5 44 14.65	2.2960	18 10 56.2	1.312	3	7 37 16.43	2.3991	17 11 10.6	3.886
4	5 46 32.50	2.2989	18 12 11.9	1.212	4	7 39 40.41	2.4003	17 7 14.1	3.997
5	5 48 50.52	2.3018	18 13 21.6	1.110	5	7 42 4.47	2.4015	17 3 10.9	4.108
6	5 51 8.72	2.3048	18 14 25.1	1.008	6	7 44 28.59	2.4025	16 59 1.1	4.218
7	5 53 27.10	2.3077	18 15 22.5	0.905	7	7 46 52.77	2.4035	16 54 44.7	4.329
8	5 55 45.65	2.3105	18 16 13.7	0.802	8	7 49 17.01	2.4046	16 50 21.6	4.440
9	5 58 4.36	2.3133	18 16 58.7	0.698	9	7 51 41.32	2.4057	16 45 51.9	4.550
10	6 0 23.25	2.3162	18 17 37.5	0.595	10	7 54 5.69	2.4066	16 41 15.6	4.660
11	6 2 42.30	2.3189	18 18 10.1	0.491	11	7 56 30.11	2.4074	16 36 32.7	4.769
12	6 5 1.52	2.3217	18 18 36.4	0.386	12	7 58 54.58	2.4083	16 31 43.3	4.878
13	6 7 20.90	2.3244	18 18 56.4	0.281	13	8 1 19.10	2.4092	16 26 47.3	4.988
14	6 9 40.45	2.3271	18 19 10.1	0.176	14	8 3 43.68	2.4100	16 21 44.7	5.098
15	6 12 0.15	2.3297	18 19 17.5	+ 0.070	15	8 6 8.30	2.4107	16 16 35.6	5.207
16	6 14 20.01	2.3323	18 19 18.5	- 0.036	16	8 8 32.96	2.4114	16 11 19.9	5.315
17	6 16 40.02	2.3348	18 19 13.2	0.142	17	8 10 57.67	2.4121	16 5 57.8	5.423
18	6 19 0.19	2.3373	18 19 1.5	0.249	18	8 13 22.41	2.4128	16 0 29.2	5.530
19	6 21 20.50	2.3398	18 18 43.3	0.357	19	8 15 47.20	2.4134	15 54 54.2	5.638
20	6 23 40.96	2.3423	18 18 18.7	0.463	20	8 18 12.02	2.4139	15 49 12.7	5.745
21	6 26 1.57	2.3448	18 17 47.7	0.571	21	8 20 36.87	2.4144	15 43 24.8	5.852
22	6 28 22.33	2.3471	18 17 10.2	0.679	22	8 23 1.75	2.4150	15 37 30.5	5.958
23	6 30 43.22	2.3494	N.18 16 26.2	0.788	23	8 25 26.67	2.4155	N.15 31 29.9	6.063
SUNDAY 2.					TUESDAY 4.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	6 33 4.26	2.3518	N.18 15 35.7	0.896	0	8 27 51.61	2.4159	N.15 25 22.9	6.169
1	6 35 25.43	2.3540	18 14 38.7	1.005	1	8 30 16.58	2.4163	15 19 9.6	6.274
2	6 37 46.74	2.3563	18 13 35.1	1.115	2	8 32 41.57	2.4167	15 12 50.0	6.378
3	6 40 8.18	2.3584	18 12 24.9	1.224	3	8 35 6.58	2.4170	15 6 24.2	6.482
4	6 42 29.75	2.3606	18 11 8.2	1.333	4	8 37 31.61	2.4173	14 59 52.2	6.586
5	6 44 51.45	2.3627	18 9 44.9	1.443	5	8 39 56.66	2.4176	14 53 13.9	6.689
6	6 47 13.27	2.3648	18 8 15.0	1.553	6	8 42 21.72	2.4178	14 46 29.5	6.791
7	6 49 35.22	2.3668	18 6 38.6	1.663	7	8 44 46.80	2.4181	14 39 39.0	6.893
8	6 51 57.29	2.3688	18 4 55.5	1.774	8	8 47 11.89	2.4183	14 32 42.3	6.995
9	6 54 19.48	2.3708	18 3 5.7	1.884	9	8 49 36.99	2.4184	14 25 39.6	7.095
10	6 56 41.79	2.3728	18 1 9.4	1.994	10	8 52 2.10	2.4186	14 18 30.9	7.195
11	6 59 4.21	2.3746	17 59 6.4	2.106	11	8 54 27.22	2.4187	14 11 16.2	7.295
12	7 1 26.74	2.3764	17 56 56.7	2.217	12	8 56 52.34	2.4187	14 3 55.5	7.394
13	7 3 49.38	2.3783	17 54 40.4	2.327	13	8 59 17.46	2.4188	13 56 28.9	7.492
14	7 6 12.13	2.3800	17 52 17.4	2.438	14	9 1 42.59	2.4188	13 48 56.4	7.590
15	7 8 34.98	2.3818	17 49 47.8	2.550	15	9 4 7.72	2.4188	13 41 18.1	7.687
16	7 10 57.94	2.3835	17 47 11.4	2.662	16	9 6 32.85	2.4188	13 33 34.0	7.783
17	7 13 20.99	2.3850	17 44 28.4	2.773	17	9 8 57.97	2.4187	13 25 44.2	7.878
18	7 15 44.14	2.3866	17 41 38.7	2.884	18	9 11 23.09	2.4187	13 17 48.6	7.973
19	7 18 7.38	2.3882	17 38 42.3	2.995	19	9 13 48.21	2.4186	13 9 47.4	8.067
20	7 20 30.72	2.3898	17 35 39.3	3.107	20	9 16 13.32	2.4184	13 1 40.6	8.160
21	7 22 54.15	2.3912	17 32 29.5	3.218	21	9 18 38.42	2.4183	12 53 28.2	8.252
22	7 25 17.66	2.3925	17 29 13.1	3.330	22	9 21 3.51	2.4182	12 45 10.3	8.344
23	7 27 41.25	2.3939	17 25 49.9	3.442	23	9 23 28.60	2.4180	12 36 46.9	8.435
24	7 30 4.93	2.3953	N.17 22 20.1	3.553	24	9 25 53.67	2.4178	N.12 28 18.1	8.525

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 5.					FRIDAY 7.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	9 25 53.67	2.4178	N. 12 28 18.1	8.525	0	11 21 32.09	2.3995	N. 4 15 12.5	11.561
1	9 28 18.73	2.4176	12 19 43.9	8.614	1	11 23 56.05	2.3993	4 3 37.9	11.592
2	9 30 43.78	2.4174	12 11 4.4	8.702	2	11 26 20.00	2.3989	3 52 1.5	11.622
3	9 33 8.82	2.4172	12 2 19.7	8.788	3	11 28 43.92	2.3986	3 40 23.3	11.651
4	9 35 33.84	2.4168	11 53 29.8	8.875	4	11 31 7.83	2.3983	3 28 43.4	11.678
5	9 37 58.84	2.4166	11 44 34.7	8.961	5	11 33 31.72	2.3980	3 17 1.9	11.703
6	9 40 23.83	2.4163	11 35 34.5	9.046	6	11 35 55.59	2.3977	3 5 19.0	11.727
7	9 42 48.80	2.4160	11 26 29.2	9.129	7	11 38 19.44	2.3974	2 53 34.7	11.750
8	9 45 13.75	2.4157	11 17 19.0	9.211	8	11 40 43.28	2.3972	2 41 49.0	11.772
9	9 47 38.68	2.4153	11 8 3.9	9.292	9	11 43 7.10	2.3969	2 30 2.1	11.791
10	9 50 3.59	2.4150	10 58 43.9	9.373	10	11 45 30.91	2.3967	2 18 14.1	11.809
11	9 52 28.48	2.4147	10 49 19.1	9.453	11	11 47 54.70	2.3964	2 6 25.0	11.826
12	9 54 53.35	2.4143	10 39 49.6	9.531	12	11 50 18.48	2.3962	1 54 35.0	11.841
13	9 57 18.20	2.4139	10 30 15.4	9.608	13	11 52 42.25	2.3960	1 42 44.1	11.854
14	9 59 43.02	2.4135	10 20 36.6	9.685	14	11 55 6.00	2.3958	1 30 52.5	11.867
15	10 2 7.82	2.4132	10 10 53.2	9.761	15	11 57 29.74	2.3956	1 19 0.1	11.878
16	10 4 32.60	2.4128	10 1 5.3	9.835	16	11 59 53.47	2.3954	1 7 7.1	11.887
17	10 6 57.35	2.4123	9 51 13.0	9.907	17	12 2 17.19	2.3953	0 55 13.7	11.893
18	10 9 22.08	2.4120	9 41 16.4	9.979	18	12 4 40.90	2.3951	0 43 19.9	11.900
19	10 11 46.79	2.4116	9 31 15.5	10.051	19	12 7 4.60	2.3950	0 31 25.7	11.905
20	10 14 11.47	2.4111	9 21 10.3	10.121	20	12 9 28.30	2.3949	0 19 31.3	11.908
21	10 16 36.12	2.4107	9 11 1.0	10.189	21	12 11 51.99	2.3948	N. 0 7 36.8	11.909
22	10 19 0.75	2.4103	9 0 47.6	10.257	22	12 14 15.67	2.3947	S. 0 4 17.8	11.909
23	10 21 25.35	2.4098	N. 8 50 30.2	10.323	23	12 16 39.35	2.3946	S. 0 16 12.3	11.908
THURSDAY 6.					SATURDAY 8.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	10 23 49.93	2.4094	N. 8 40 8.8	10.388	0	12 19 3.02	2.3944	S. 0 28 6.7	11.904
1	10 26 14.48	2.4089	8 29 43.6	10.452	1	12 21 26.68	2.3943	0 40 0.8	11.899
2	10 28 39.00	2.4085	8 19 14.6	10.515	2	12 23 50.34	2.3943	0 51 54.6	11.893
3	10 31 3.50	2.4081	8 8 41.8	10.577	3	12 26 14.00	2.3943	1 3 48.0	11.885
4	10 33 27.97	2.4077	7 58 5.4	10.636	4	12 28 37.65	2.3942	1 15 40.8	11.875
5	10 35 52.42	2.4073	7 47 25.5	10.695	5	12 31 1.30	2.3942	1 27 33.0	11.865
6	10 38 16.84	2.4068	7 36 42.0	10.753	6	12 33 24.95	2.3942	1 39 24.6	11.853
7	10 40 41.23	2.4063	7 25 55.1	10.809	7	12 35 48.60	2.3942	1 51 15.3	11.838
8	10 43 5.59	2.4058	7 15 4.9	10.864	8	12 38 12.25	2.3942	2 3 5.2	11.823
9	10 45 29.93	2.4055	7 4 11.4	10.918	9	12 40 35.90	2.3943	2 14 54.1	11.807
10	10 47 54.25	2.4051	6 53 14.7	10.971	10	12 42 59.56	2.3943	2 26 42.0	11.788
11	10 50 18.54	2.4047	6 42 14.9	11.022	11	12 45 23.21	2.3943	2 38 28.7	11.768
12	10 52 42.81	2.4043	6 31 12.1	11.071	12	12 47 46.87	2.3943	2 50 14.2	11.748
13	10 55 7.05	2.4038	6 20 6.4	11.119	13	12 50 10.53	2.3943	3 1 58.4	11.725
14	10 57 31.26	2.4033	6 8 57.8	11.167	14	12 52 34.19	2.3944	3 13 41.2	11.700
15	10 59 55.45	2.4030	5 57 46.4	11.213	15	12 54 57.86	2.3945	3 25 22.4	11.674
16	11 2 19.62	2.4026	5 46 32.3	11.257	16	12 57 21.53	2.3945	3 37 2.1	11.647
17	11 4 43.76	2.4021	5 35 15.6	11.299	17	12 59 45.20	2.3946	3 48 40.1	11.618
18	11 7 7.87	2.4017	5 23 56.4	11.341	18	13 2 8.88	2.3947	4 0 16.3	11.584
19	11 9 31.96	2.4013	5 12 34.7	11.382	19	13 4 32.57	2.3948	4 11 50.7	11.557
20	11 11 56.03	2.4010	5 1 10.6	11.420	20	13 6 56.26	2.3949	4 23 23.2	11.524
21	11 14 20.08	2.4007	4 49 44.3	11.457	21	13 9 19.96	2.3950	4 34 53.6	11.489
22	11 16 44.11	2.4003	4 38 15.8	11.493	22	13 11 43.66	2.3951	4 46 21.9	11.453
23	11 19 8.11	2.3998	4 26 45.2	11.528	23	13 14 7.37	2.3952	4 57 48.0	11.416
24	11 21 32.09	2.3995	N. 4 15 12.5	11.561	24	13 16 31.09	2.3953	S. 5 9 11.8	11.377

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 9.					TUESDAY 11.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
1	13 16 31.09	2.3953	S. 5 9 11.8	11.377	1	15 11 35.52	2.3957	S. 13 6 10.6	8.068
2	13 18 54.81	2.3954	5 20 33.2	11.337	2	15 13 59.25	2.3953	13 14 11.9	7.975
3	13 21 18.54	2.3956	5 31 52.2	11.295	3	15 16 22.95	2.3948	13 22 7.6	7.882
4	13 23 42.28	2.3958	5 43 8.6	11.252	4	15 18 46.62	2.3943	13 29 57.7	7.788
5	13 26 6.03	2.3959	5 54 22.4	11.208	5	15 21 10.27	2.3940	13 37 42.1	7.692
6	13 28 29.79	2.3960	6 5 33.5	11.162	6	15 23 33.90	2.3935	13 45 20.7	7.595
7	13 30 53.55	2.3961	6 16 41.8	11.114	7	15 25 57.49	2.3929	13 52 53.5	7.499
8	13 33 17.32	2.3963	6 27 47.2	11.066	8	15 28 21.05	2.3924	14 0 20.6	7.402
9	13 35 41.10	2.3964	6 38 49.7	11.016	9	15 30 44.58	2.3918	14 7 41.8	7.304
10	13 38 4.89	2.3966	6 49 49.1	10.964	10	15 33 8.07	2.3912	14 14 57.1	7.206
11	13 40 28.69	2.3968	7 0 45.4	10.912	11	15 35 31.52	2.3906	14 22 6.5	7.107
12	13 42 52.50	2.3969	7 11 38.5	10.858	12	15 37 54.94	2.3900	14 29 10.0	7.008
13	13 45 16.32	2.3970	7 22 28.4	10.804	13	15 40 18.32	2.3893	14 36 7.5	6.908
14	13 47 40.14	2.3971	7 33 14.9	10.747	14	15 42 41.66	2.3886	14 42 59.0	6.808
15	13 50 3.97	2.3972	7 43 58.0	10.689	15	15 45 4.95	2.3878	14 49 44.4	6.707
16	13 52 27.81	2.3974	7 54 37.6	10.630	16	15 47 28.19	2.3870	14 56 23.8	6.606
17	13 54 51.66	2.3976	8 5 13.6	10.569	17	15 49 51.39	2.3862	15 2 57.1	6.503
18	13 57 15.52	2.3977	8 15 45.9	10.507	18	15 52 14.54	2.3853	15 9 24.2	6.401
19	13 59 39.38	2.3978	8 26 14.5	10.445	19	15 54 37.63	2.3844	15 15 45.2	6.298
20	14 2 3.25	2.3979	8 36 39.3	10.382	20	15 57 0.67	2.3836	15 22 0.0	6.195
21	14 4 27.13	2.3980	8 47 0.3	10.317	21	15 59 23.66	2.3827	15 28 8.6	6.092
22	14 6 51.01	2.3981	8 57 17.4	10.251	22	16 1 46.59	2.3817	15 34 11.0	5.988
23	14 9 14.90	2.3982	9 7 30.4	10.183	23	16 4 9.46	2.3806	15 40 7.1	5.883
24	14 11 38.79	2.3983	S. 9 17 39.3	10.114	24	16 6 32.26	2.3795	S. 15 45 56.9	5.778
MONDAY 10.					WEDNESDAY 12.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
1	14 14 2.69	2.3983	S. 9 27 44.1	10.044	1	16 8 55.00	2.3785	S. 15 51 40.5	5.674
2	14 16 26.59	2.3983	9 37 44.6	9.973	2	16 11 17.68	2.3773	15 57 17.8	5.568
3	14 18 50.49	2.3984	9 47 40.9	9.902	3	16 13 40.28	2.3761	16 2 48.7	5.463
4	14 21 14.40	2.3985	9 57 32.8	9.828	4	16 16 2.81	2.3749	16 8 13.3	5.357
5	14 23 38.31	2.3985	10 7 20.3	9.754	5	16 18 25.27	2.3737	16 13 31.5	5.251
6	14 26 2.22	2.3985	10 17 3.3	9.679	6	16 20 47.66	2.3725	16 18 43.4	5.145
7	14 28 26.13	2.3985	10 26 41.8	9.603	7	16 23 9.97	2.3711	16 23 48.9	5.038
8	14 30 50.04	2.3985	10 36 15.7	9.526	8	16 25 32.19	2.3697	16 28 48.0	4.932
9	14 33 13.95	2.3985	10 45 44.9	9.447	9	16 27 54.33	2.3683	16 33 40.7	4.824
10	14 35 37.86	2.3984	10 55 9.3	9.368	10	16 30 16.39	2.3669	16 38 26.9	4.717
11	14 38 1.76	2.3983	11 4 29.0	9.288	11	16 32 38.36	2.3654	16 43 6.7	4.610
12	14 40 25.66	2.3983	11 13 43.8	9.207	12	16 35 0.24	2.3639	16 47 40.1	4.503
13	14 42 49.56	2.3982	11 22 53.8	9.125	13	16 37 22.03	2.3624	16 52 7.0	4.395
14	14 45 13.45	2.3981	11 31 58.8	9.041	14	16 39 43.73	2.3608	16 56 27.5	4.288
15	14 47 37.33	2.3980	11 40 58.7	8.957	15	16 42 5.33	2.3592	17 0 41.5	4.179
16	14 50 1.21	2.3979	11 49 53.6	8.873	16	16 44 26.83	2.3575	17 4 49.0	4.072
17	14 52 25.08	2.3977	11 58 43.4	8.786	17	16 46 48.23	2.3558	17 8 50.1	3.964
18	14 54 48.94	2.3975	12 7 27.9	8.699	18	16 49 9.53	2.3541	17 12 44.7	3.856
19	14 57 12.78	2.3973	12 16 7.3	8.612	19	16 51 30.72	2.3523	17 16 32.8	3.748
20	14 59 36.61	2.3971	12 24 41.4	8.523	20	16 53 51.81	2.3506	17 20 14.4	3.640
21	15 2 0.43	2.3968	12 33 10.1	8.433	21	16 56 12.79	2.3487	17 23 49.6	3.533
22	15 4 24.23	2.3965	12 41 33.4	8.343	22	16 58 33.65	2.3468	17 27 18.3	3.424
23	15 6 48.01	2.3962	12 49 51.3	8.253	23	17 0 54.40	2.3448	17 30 40.5	3.315
24	15 9 11.77	2.3959	12 58 3.7	8.161	24	17 3 15.03	2.3429	17 33 56.2	3.208
25	15 11 35.52	2.3957	S. 13 6 10.6	8.068	25	17 5 35.55	2.3409	S. 17 37 5.5	3.101

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.			Diff. for 1 Minute.	Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.			Diff. for 1 Minute.
THURSDAY 13.									SATURDAY 15.								
0	h	m	s	"	"	"	"	"	0	h	m	s	"	"	"	"	
0	17	5	35.55	2.3409	S. 17	37	5.5	3.101	0	18	55	1.05	2.2078	S. 18	5	43.4	1.779
1	17	7	55.94	2.3388	17	40	8.3	2.993	1	18	57	13.42	2.2046	18	3	53.9	1.871
2	17	10	16.21	2.3368	17	43	4.6	2.885	2	18	59	25.60	2.2012	18	1	58.9	1.962
3	17	12	36.35	2.3347	17	45	54.5	2.778	3	19	1	37.57	2.1978	17	59	58.4	2.053
4	17	14	56.37	2.3326	17	48	38.0	2.671	4	19	3	49.34	2.1945	17	57	52.5	2.143
5	17	17	16.26	2.3303	17	51	15.0	2.563	5	19	6	0.91	2.1912	17	55	41.2	2.233
6	17	19	36.01	2.3281	17	53	45.6	2.456	6	19	8	12.28	2.1878	17	53	24.6	2.322
7	17	21	55.63	2.3258	17	56	9.7	2.348	7	19	10	23.44	2.1843	17	51	2.6	2.411
8	17	24	15.11	2.3236	17	58	27.4	2.242	8	19	12	34.40	2.1810	17	48	35.3	2.499
9	17	26	34.46	2.3212	18	0	38.7	2.135	9	19	14	45.16	2.1776	17	46	2.7	2.587
10	17	28	53.66	2.3188	18	2	43.6	2.028	10	19	16	55.71	2.1742	17	43	24.8	2.674
11	17	31	12.72	2.3165	18	4	42.1	1.923	11	19	19	6.06	2.1708	17	40	41.8	2.760
12	17	33	31.64	2.3141	18	6	34.3	1.817	12	19	21	16.20	2.1673	17	37	53.6	2.847
13	17	35	50.41	2.3116	18	8	20.1	1.711	13	19	23	26.14	2.1639	17	35	0.2	2.933
14	17	38	9.03	2.3091	18	9	59.6	1.605	14	19	25	35.87	2.1605	17	32	1.7	3.017
15	17	40	27.50	2.3066	18	11	32.7	1.500	15	19	27	45.40	2.1571	17	28	58.2	3.101
16	17	42	45.82	2.3040	18	12	59.6	1.395	16	19	29	54.72	2.1536	17	25	49.6	3.185
17	17	45	3.98	2.3013	18	14	20.1	1.289	17	19	32	3.83	2.1502	17	22	36.0	3.268
18	17	47	21.98	2.2988	18	15	34.3	1.185	18	19	34	12.74	2.1468	17	19	17.4	3.351
19	17	49	39.83	2.2962	18	16	42.3	1.081	19	19	36	21.44	2.1433	17	15	53.9	3.433
20	17	51	57.52	2.2934	18	17	44.0	0.977	20	19	38	29.94	2.1399	17	12	25.5	3.514
21	17	54	15.04	2.2907	18	18	39.5	0.873	21	19	40	38.23	2.1365	17	8	52.2	3.596
22	17	56	32.40	2.2880	18	19	28.8	0.769	22	19	42	46.32	2.1331	17	5	14.0	3.677
23	17	58	49.60	2.2853	S. 18	20	11.8	0.666	23	19	44	54.20	2.1296	S. 17	1	31.0	3.756
FRIDAY 14.									SUNDAY 16.								
0	18	1	6.63	2.2824	S. 18	20	48.7	0.564	0	19	47	1.87	2.1262	S. 16	57	43.3	3.835
1	18	3	23.49	2.2795	18	21	19.5	0.462	1	19	49	9.34	2.1228	16	53	50.8	3.914
2	18	5	40.17	2.2766	18	21	44.1	0.359	2	19	51	16.60	2.1193	16	49	53.6	3.992
3	18	7	56.68	2.2737	18	22	2.6	0.258	3	19	53	23.66	2.1160	16	45	51.8	4.069
4	18	10	13.02	2.2708	18	22	15.0	0.157	4	19	55	30.52	2.1126	16	41	45.3	4.147
5	18	12	29.18	2.2679	18	22	21.4	-0.056	5	19	57	37.17	2.1092	16	37	34.2	4.223
6	18	14	45.17	2.2650	18	22	21.7	+0.045	6	19	59	43.62	2.1058	16	33	18.5	4.299
7	18	17	0.98	2.2620	18	22	16.0	0.145	7	20	1	49.87	2.1024	16	28	58.3	4.374
8	18	19	16.61	2.2589	18	22	4.3	0.245	8	20	3	55.91	2.0990	16	24	33.6	4.449
9	18	21	32.05	2.2558	18	21	46.6	0.344	9	20	6	1.75	2.0957	16	20	4.4	4.523
10	18	23	47.31	2.2528	18	21	23.0	0.443	10	20	8	7.39	2.0923	16	15	30.8	4.597
11	18	26	2.39	2.2497	18	20	53.4	0.542	11	20	10	12.82	2.0889	16	10	52.8	4.670
12	18	28	17.28	2.2466	18	20	18.0	0.639	12	20	12	18.06	2.0857	16	6	10.4	4.743
13	18	30	31.98	2.2435	18	19	36.7	0.737	13	20	14	23.10	2.0823	16	1	23.7	4.814
14	18	32	46.50	2.2404	18	18	49.6	0.833	14	20	16	27.94	2.0790	15	56	32.7	4.885
15	18	35	0.83	2.2372	18	17	56.7	0.930	15	20	18	32.58	2.0757	15	51	37.5	4.956
16	18	37	14.96	2.2339	18	16	58.0	1.027	16	20	20	37.02	2.0723	15	46	38.0	5.027
17	18	39	28.90	2.2308	18	15	53.5	1.123	17	20	22	41.26	2.0691	15	41	34.3	5.096
18	18	41	42.65	2.2276	18	14	43.3	1.218	18	20	24	45.31	2.0659	15	36	26.5	5.164
19	18	43	56.21	2.2243	18	13	27.4	1.313	19	20	26	49.17	2.0627	15	31	14.6	5.233
20	18	46	9.57	2.2211	18	12	5.8	1.407	20	20	28	52.83	2.0594	15	25	58.6	5.301
21	18	48	22.74	2.2178	18	10	38.6	1.500	21	20	30	56.30	2.0563	15	20	38.5	5.368
22	18	50	35.71	2.2145	18	9	5.8	1.593	22	20	32	59.58	2.0531	15	15	14.4	5.434
23	18	52	48.48	2.2112	18	7	27.4	1.687	23	20	35	2.67	2.0499	15	9	46.4	5.500
24	18	55	1.05	2.2078	S. 18	5	43.4	1.779	24	20	37	5.57	2.0468	S. 15	4	14.4	5.566

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 17.					WEDNESDAY 19.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	20 37 5.57	2.0468	S. 15 4 14.4	5.566	0	22 12 9.49	1.9252	S. 9 32 19.0	8.051
1	20 39 8.28	2.0436	14 58 38.5	5.631	1	22 14 4.95	1.9234	9 24 14.8	8.090
2	20 41 10.80	2.0405	14 52 58.7	5.696	2	22 16 0.30	1.9217	9 16 8.2	8.128
3	20 43 13.14	2.0374	14 47 15.0	5.759	3	22 17 55.55	1.9199	9 7 59.4	8.165
4	20 45 15.29	2.0343	14 41 27.6	5.822	4	22 19 50.69	1.9183	8 59 48.4	8.202
5	20 47 17.26	2.0313	14 35 36.4	5.885	5	22 21 45.74	1.9167	8 51 35.2	8.238
6	20 49 19.05	2.0283	14 29 41.4	5.947	6	22 23 40.69	1.9151	8 43 19.8	8.274
7	20 51 20.65	2.0253	14 23 42.7	6.009	7	22 25 35.55	1.9135	8 35 2.3	8.309
8	20 53 22.08	2.0223	14 17 40.3	6.070	8	22 27 30.31	1.9119	8 26 42.7	8.343
9	20 55 23.33	2.0193	14 11 34.3	6.130	9	22 29 24.98	1.9105	8 18 21.1	8.378
10	20 57 24.40	2.0163	14 5 24.7	6.190	10	22 31 19.57	1.9091	8 9 57.4	8.412
11	20 59 25.29	2.0134	13 59 11.5	6.249	11	22 33 14.07	1.9076	8 1 31.7	8.444
12	21 1 26.01	2.0106	13 52 54.8	6.308	12	22 35 8.48	1.9062	7 53 4.1	8.477
13	21 3 26.56	2.0077	13 46 34.6	6.366	13	22 37 2.81	1.9048	7 44 34.5	8.509
14	21 5 26.93	2.0048	13 40 10.9	6.423	14	22 38 57.06	1.9035	7 36 3.0	8.540
15	21 7 27.14	2.0021	13 33 43.8	6.481	15	22 40 51.23	1.9023	7 27 29.7	8.571
16	21 9 27.18	1.9993	13 27 13.2	6.537	16	22 42 45.33	1.9010	7 18 54.5	8.602
17	21 11 27.05	1.9964	13 20 39.3	6.593	17	22 44 39.35	1.8998	7 10 17.5	8.631
18	21 13 26.75	1.9937	13 14 2.1	6.648	18	22 46 33.30	1.8987	7 1 38.8	8.660
19	21 15 26.29	1.9910	13 7 21.6	6.703	19	22 48 27.19	1.8976	6 52 58.3	8.689
20	21 17 25.67	1.9883	13 0 37.8	6.757	20	22 50 21.01	1.8965	6 44 16.1	8.717
21	21 19 24.89	1.9857	12 53 50.8	6.811	21	22 52 14.77	1.8954	6 35 32.2	8.745
22	21 21 23.95	1.9830	12 47 0.5	6.864	22	22 54 8.46	1.8943	6 26 46.7	8.773
23	21 23 22.85	1.9803	S. 12 40 7.1	6.916	23	22 56 2.09	1.8934	S. 6 17 59.5	8.799
TUESDAY 18.					THURSDAY 20.				
0	21 25 21.59	1.9778	S. 12 33 10.6	6.968	0	22 57 55.67	1.8925	S. 6 9 10.8	8.825
1	21 27 20.18	1.9753	12 26 10.9	7.020	1	22 59 49.19	1.8916	6 0 20.5	8.851
2	21 29 18.62	1.9728	12 19 8.2	7.070	2	23 1 42.66	1.8908	5 51 28.7	8.876
3	21 31 16.91	1.9703	12 12 2.5	7.120	3	23 3 36.08	1.8899	5 42 35.4	8.900
4	21 33 15.05	1.9678	12 4 53.8	7.170	4	23 5 29.45	1.8892	5 33 40.7	8.923
5	21 35 13.04	1.9653	11 57 42.1	7.220	5	23 7 22.78	1.8884	5 24 44.6	8.947
6	21 37 10.89	1.9629	11 50 27.4	7.268	6	23 9 16.06	1.8877	5 15 47.0	8.971
7	21 39 8.59	1.9605	11 43 9.9	7.316	7	23 11 9.30	1.8870	5 6 48.1	8.993
8	21 41 6.15	1.9583	11 35 49.5	7.364	8	23 13 2.50	1.8864	4 57 47.9	9.014
9	21 43 3.58	1.9560	11 28 26.2	7.412	9	23 14 55.67	1.8858	4 48 46.4	9.035
10	21 45 0.87	1.9537	11 21 0.1	7.458	10	23 16 48.80	1.8853	4 39 43.7	9.056
11	21 46 58.02	1.9513	11 13 31.3	7.503	11	23 18 41.90	1.8848	4 30 39.7	9.077
12	21 48 55.03	1.9491	11 5 59.8	7.548	12	23 20 34.97	1.8843	4 21 34.5	9.096
13	21 50 51.91	1.9469	10 58 25.5	7.593	13	23 22 28.01	1.8838	4 12 28.2	9.115
14	21 52 48.66	1.9448	10 50 48.6	7.638	14	23 24 21.03	1.8834	4 3 20.7	9.134
15	21 54 45.29	1.9428	10 43 9.0	7.682	15	23 26 14.02	1.8831	3 54 12.1	9.152
16	21 56 41.79	1.9407	10 35 26.8	7.725	16	23 28 7.00	1.8828	3 45 2.5	9.169
17	21 58 38.17	1.9386	10 27 42.0	7.768	17	23 29 59.96	1.8825	3 35 51.8	9.187
18	22 0 34.42	1.9365	10 19 54.6	7.810	18	23 31 52.90	1.8823	3 26 40.1	9.203
19	22 2 30.55	1.9346	10 12 4.8	7.851	19	23 33 45.83	1.8820	3 17 27.5	9.218
20	22 4 26.57	1.9327	10 4 12.5	7.892	20	23 35 38.74	1.8818	3 8 13.9	9.233
21	22 6 22.47	1.9307	9 56 17.7	7.933	21	23 37 31.65	1.8818	2 58 59.5	9.248
22	22 8 18.25	1.9288	9 48 20.5	7.973	22	23 39 24.55	1.8817	2 49 44.2	9.263
23	22 10 13.92	1.9270	9 40 20.9	8.012	23	23 41 17.45	1.8816	2 40 28.0	9.276
24	22 12 9.49	1.9252	S. 9 32 19.0	8.051	24	23 43 10.34	1.8815	S. 2 31 11.1	9.288

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 21.					SUNDAY 23.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	23 43 10.34	1.8815	S. 2 31 11.1	9.288	0	1 14 12.33	1.9257	N. 4 58 36.1	9.220
1	23 45 3.23	1.8816	2 21 53.4	9.301	1	1 16 7.93	1.9276	5 7 48.8	9.203
2	23 46 56.13	1.8817	2 12 35.0	9.313	2	1 18 3.64	1.9294	5 17 0.5	9.186
3	23 48 49.04	1.8818	2 3 15.9	9.324	3	1 19 59.46	1.9313	5 26 11.1	9.168
4	23 50 41.95	1.8819	1 53 56.1	9.335	4	1 21 55.40	1.9332	5 35 20.6	9.148
5	23 52 34.87	1.8821	1 44 35.7	9.345	5	1 23 51.45	1.9352	5 44 28.9	9.129
6	23 54 27.80	1.8823	1 35 14.7	9.354	6	1 25 47.62	1.9372	5 53 36.1	9.110
7	23 56 20.75	1.8827	1 25 53.2	9.363	7	1 27 43.91	1.9392	6 2 42.1	9.089
8	23 58 13.72	1.8829	1 16 31.1	9.372	8	1 29 40.32	1.9412	6 11 46.8	9.068
9	0 0 6.70	1.8833	1 7 8.5	9.380	9	1 31 36.86	1.9433	6 20 50.2	9.046
10	0 1 59.71	1.8837	0 57 45.5	9.388	10	1 33 33.52	1.9453	6 29 52.3	9.023
11	0 3 52.74	1.8840	0 48 22.0	9.394	11	1 35 30.30	1.9475	6 38 52.9	8.999
12	0 5 45.79	1.8844	0 38 58.2	9.400	12	1 37 27.22	1.9497	6 47 52.2	8.976
13	0 7 38.87	1.8849	0 29 34.0	9.406	13	1 39 24.27	1.9519	6 56 50.0	8.951
14	0 9 31.98	1.8855	0 20 9.5	9.411	14	1 41 21.45	1.9541	7 5 46.3	8.925
15	0 11 25.13	1.8862	0 10 44.7	9.416	15	1 43 18.76	1.9563	7 14 41.0	8.899
16	0 13 18.32	1.8868	S. 0 1 19.6	9.419	16	1 45 16.21	1.9587	7 23 34.2	8.873
17	0 15 11.54	1.8873	N. 0 8 5.6	9.423	17	1 47 13.80	1.9610	7 32 25.7	8.844
18	0 17 4.80	1.8880	0 17 31.1	9.426	18	1 49 11.53	1.9633	7 41 15.5	8.816
19	0 18 58.10	1.8888	0 26 56.7	9.427	19	1 51 9.40	1.9657	7 50 3.6	8.787
20	0 20 51.45	1.8895	0 36 22.3	9.428	20	1 53 7.42	1.9682	7 58 50.0	8.758
21	0 22 44.84	1.8903	0 45 48.1	9.430	21	1 55 5.58	1.9706	8 7 34.6	8.728
22	0 24 38.28	1.8912	0 55 13.9	9.430	22	1 57 3.89	1.9730	8 16 17.3	8.697
23	0 26 31.78	1.8921	N. 1 4 39.7	9.429	23	1 59 2.34	1.9755	N. 8 24 58.2	8.665
SATURDAY 22.					MONDAY 24.				
0	0 28 25.33	1.8930	N. 1 14 5.4	9.428	0	2 1 0.95	1.9781	N. 8 33 37.1	8.633
1	0 30 18.94	1.8939	1 23 31.1	9.427	1	2 2 59.71	1.9806	8 42 14.1	8.599
2	0 32 12.60	1.8948	1 32 56.6	9.424	2	2 4 58.62	1.9832	8 50 49.0	8.565
3	0 34 6.32	1.8959	1 42 22.0	9.422	3	2 6 57.69	1.9858	8 59 21.9	8.531
4	0 36 0.11	1.8970	1 51 47.3	9.419	4	2 8 56.91	1.9884	9 7 52.7	8.495
5	0 37 53.96	1.8980	2 1 12.3	9.414	5	2 10 56.30	1.9911	9 16 21.4	8.459
6	0 39 47.87	1.8992	2 10 37.0	9.410	6	2 12 55.84	1.9937	9 24 47.8	8.422
7	0 41 41.86	1.9004	2 20 1.5	9.405	7	2 14 55.54	1.9964	9 33 12.0	8.385
8	0 43 35.92	1.9016	2 29 25.6	9.399	8	2 16 55.41	1.9992	9 41 34.0	8.347
9	0 45 30.05	1.9028	2 38 49.4	9.393	9	2 18 55.44	2.0019	9 49 53.7	8.308
10	0 47 24.26	1.9041	2 48 12.8	9.386	10	2 20 55.64	2.0047	9 58 11.0	8.268
11	0 49 18.54	1.9054	2 57 35.7	9.378	11	2 22 56.01	2.0075	10 6 25.9	8.228
12	0 51 12.91	1.9068	3 6 58.1	9.369	12	2 24 56.54	2.0103	10 14 38.3	8.187
13	0 53 7.36	1.9082	3 16 20.0	9.361	13	2 26 57.24	2.0132	10 22 48.3	8.145
14	0 55 1.89	1.9096	3 25 41.4	9.352	14	2 28 58.12	2.0161	10 30 55.7	8.102
15	0 56 56.51	1.9111	3 35 2.2	9.341	15	2 30 59.17	2.0189	10 39 0.5	8.059
16	0 58 51.22	1.9126	3 44 22.3	9.329	16	2 33 0.39	2.0218	10 47 2.8	8.016
17	1 0 46.02	1.9141	3 53 41.7	9.318	17	2 35 1.79	2.0247	10 55 2.4	7.970
18	1 2 40.91	1.9157	4 3 0.5	9.307	18	2 37 3.36	2.0277	11 2 59.2	7.924
19	1 4 35.90	1.9173	4 12 18.5	9.294	19	2 39 5.11	2.0307	11 10 53.3	7.878
20	1 6 30.98	1.9189	4 21 35.8	9.281	20	2 41 7.04	2.0337	11 18 44.6	7.832
21	1 8 26.17	1.9206	4 30 52.2	9.267	21	2 43 9.15	2.0367	11 26 33.1	7.784
22	1 10 21.45	1.9222	4 40 7.8	9.252	22	2 45 11.44	2.0397	11 34 18.7	7.735
23	1 12 16.84	1.9240	4 49 22.4	9.236	23	2 47 13.91	2.0427	11 42 1.3	7.686
24	1 14 12.33	1.9257	N. 4 58 36.1	9.220	24	2 49 16.57	2.0458	N. 11 49 41.0	7.637

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 25.					THURSDAY 27.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	2 49 16.57	2.0458	N. 11 49 41.0	7.637	0	4 31 9.89	2.1999	N. 16 44 47.7	4.386
1	2 51 19.41	2.0488	11 57 17.7	7.586	1	4 33 21.98	2.2031	16 49 8.3	4.301
2	2 53 22.43	2.0519	12 4 51.3	7.534	2	4 35 34.26	2.2062	16 53 23.8	4.216
3	2 55 25.64	2.0551	12 12 21.8	7.482	3	4 37 46.72	2.2092	16 57 34.2	4.130
4	2 57 29.04	2.0582	12 19 49.1	7.429	4	4 39 59.36	2.2122	17 1 39.4	4.043
5	2 59 32.62	2.0613	12 27 13.3	7.376	5	4 42 12.18	2.2153	17 5 39.4	3.956
6	3 1 36.39	2.0644	12 34 34.2	7.321	6	4 44 25.19	2.2183	17 9 34.1	3.868
7	3 3 40.35	2.0675	12 41 51.8	7.266	7	4 46 38.37	2.2212	17 13 23.6	3.781
8	3 5 44.49	2.0707	12 49 6.1	7.210	8	4 48 51.73	2.2242	17 17 7.8	3.692
9	3 7 48.83	2.0739	12 56 17.0	7.153	9	4 51 5.27	2.2272	17 20 46.6	3.603
10	3 9 53.36	2.0771	13 3 24.5	7.097	10	4 53 18.99	2.2301	17 24 20.1	3.513
11	3 11 58.08	2.0803	13 10 28.6	7.039	11	4 55 32.88	2.2329	17 27 48.1	3.422
12	3 14 2.99	2.0835	13 17 29.2	6.980	12	4 57 46.94	2.2358	17 31 10.7	3.331
13	3 16 8.10	2.0868	13 24 26.2	6.920	13	5 0 1.17	2.2386	17 34 27.8	3.239
14	3 18 13.40	2.0900	13 31 19.6	6.860	14	5 2 15.57	2.2414	17 37 39.4	3.147
15	3 20 18.90	2.0932	13 38 9.4	6.799	15	5 4 30.14	2.2443	17 40 45.4	3.053
16	3 22 24.59	2.0964	13 44 55.5	6.738	16	5 6 44.88	2.2470	17 43 45.8	2.960
17	3 24 30.47	2.0997	13 51 37.9	6.675	17	5 8 59.78	2.2497	17 46 40.6	2.867
18	3 26 36.55	2.1030	13 58 16.5	6.612	18	5 11 14.84	2.2524	17 49 29.8	2.773
19	3 28 42.83	2.1063	14 4 51.3	6.548	19	5 13 30.07	2.2551	17 52 13.3	2.678
20	3 30 49.30	2.1095	14 11 22.2	6.483	20	5 15 45.45	2.2578	17 54 51.1	2.582
21	3 32 55.97	2.1128	14 17 49.2	6.418	21	5 18 1.00	2.2604	17 57 23.1	2.485
22	3 35 2.83	2.1160	14 24 12.3	6.352	22	5 20 16.70	2.2629	17 59 49.3	2.389
23	3 37 9.89	2.1193	N. 14 30 31.4	6.285	23	5 22 32.55	2.2655	N. 18 2 9.8	2.293
WEDNESDAY 26.					FRIDAY 28.				
0	3 39 17.14	2.1225	N. 14 36 46.5	6.217	0	5 24 48.56	2.2681	N. 18 4 24.5	2.196
1	3 41 24.59	2.1258	14 42 57.5	6.148	1	5 27 4.72	2.2706	18 6 33.3	2.098
2	3 43 32.24	2.1292	14 49 4.3	6.079	2	5 29 21.03	2.2731	18 8 36.2	2.000
3	3 45 40.09	2.1324	14 55 7.0	6.010	3	5 31 37.49	2.2755	18 10 33.3	1.902
4	3 47 48.13	2.1357	15 1 5.5	5.939	4	5 33 54.09	2.2778	18 12 24.4	1.802
5	3 49 56.37	2.1390	15 6 59.7	5.868	5	5 36 10.83	2.2802	18 14 9.5	1.702
6	3 52 4.81	2.1423	15 12 49.7	5.797	6	5 38 27.72	2.2826	18 15 48.6	1.602
7	3 54 13.44	2.1455	15 18 35.3	5.724	7	5 40 44.74	2.2848	18 17 21.7	1.502
8	3 56 22.27	2.1488	15 24 16.6	5.651	8	5 43 1.90	2.2871	18 18 48.8	1.401
9	3 58 31.30	2.1521	15 29 53.4	5.576	9	5 45 19.19	2.2893	18 20 9.8	1.300
10	4 0 40.52	2.1553	15 35 25.7	5.502	10	5 47 36.61	2.2915	18 21 24.8	1.199
11	4 2 49.94	2.1586	15 40 53.6	5.427	11	5 49 54.17	2.2937	18 22 33.7	1.097
12	4 4 59.55	2.1618	15 46 16.9	5.350	12	5 52 11.85	2.2958	18 23 36.4	0.994
13	4 7 9.36	2.1651	15 51 35.6	5.273	13	5 54 29.66	2.2978	18 24 33.0	0.892
14	4 9 19.36	2.1683	15 56 49.7	5.197	14	5 56 47.59	2.2998	18 25 23.4	0.789
15	4 11 29.55	2.1715	16 1 59.2	5.118	15	5 59 5.64	2.3018	18 26 7.7	0.686
16	4 13 39.94	2.1747	16 7 3.9	5.039	16	6 1 23.81	2.3038	18 26 45.7	0.583
17	4 15 50.52	2.1779	16 12 3.9	4.960	17	6 3 42.10	2.3058	18 27 17.6	0.479
18	4 18 1.29	2.1811	16 16 59.1	4.880	18	6 6 0.50	2.3076	18 27 43.2	0.374
19	4 20 12.25	2.1843	16 21 49.5	4.799	19	6 8 19.01	2.3094	18 28 2.5	0.270
20	4 22 23.40	2.1874	16 26 35.0	4.718	20	6 10 37.63	2.3112	18 28 15.6	0.166
21	4 24 34.74	2.1906	16 31 15.6	4.636	21	6 12 56.36	2.3130	18 28 22.4	+ 0.060
22	4 26 46.27	2.1937	16 35 51.3	4.553	22	6 15 15.19	2.3147	18 28 22.8	- 0.045
23	4 28 57.99	2.1968	16 40 22.0	4.470	23	6 17 34.12	2.3164	18 28 17.0	0.149
24	4 31 9.89	2.1999	N. 16 44 47.7	4.386	24	6 19 53.16	2.3181	N. 18 28 4.9	0.255



GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 29.					MONDAY 31.				
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	6 19 53.16	2.3181	N. 18 28 4.9	0.255	0	8 12 16.99	2.3508	N. 16 12 55.3	5.343
1	6 22 12.29	2.3197	18 27 46.4	0.361	1	8 14 38.03	2.3507	16 7 31.7	5.444
2	6 24 31.52	2.3213	18 27 21.6	0.467	2	8 16 59.07	2.3505	16 2 2.0	5.545
3	6 26 50.85	2.3228	18 26 50.4	0.573	3	8 19 20.09	2.3503	15 56 26.3	5.645
4	6 29 10.26	2.3242	18 26 12.8	0.680	4	8 21 41.10	2.3501	15 50 44.6	5.745
5	6 31 29.76	2.3257	18 25 28.8	0.787	5	8 24 2.10	2.3498	15 44 56.9	5.845
6	6 33 49.34	2.3271	18 24 38.4	0.893	6	8 26 23.08	2.3495	15 39 3.2	5.944
7	6 36 9.01	2.3284	18 23 41.7	0.999	7	8 28 44.04	2.3493	15 33 3.6	6.043
8	6 38 28.75	2.3297	18 22 38.5	1.107	8	8 31 4.99	2.3490	15 26 58.1	6.141
9	6 40 48.57	2.3310	18 21 28.9	1.213	9	8 33 25.92	2.3487	15 20 46.7	6.238
10	6 43 8.47	2.3322	18 20 12.9	1.320	10	8 35 46.83	2.3483	15 14 29.5	6.336
11	6 45 28.44	2.3334	18 18 50.5	1.427	11	8 38 7.72	2.3479	15 8 6.4	6.433
12	6 47 48.48	2.3346	18 17 21.7	1.534	12	8 40 28.58	2.3475	15 1 37.6	6.528
13	6 50 8.59	2.3357	18 15 46.4	1.643	13	8 42 49.42	2.3472	14 55 3.0	6.624
14	6 52 28.76	2.3367	18 14 4.6	1.750	14	8 45 10.24	2.3468	14 48 22.7	6.719
15	6 54 49.00	2.3378	18 12 16.4	1.857	15	8 47 31.03	2.3463	14 41 36.7	6.813
16	6 57 9.30	2.3387	18 10 21.8	1.964	16	8 49 51.79	2.3458	14 34 45.1	6.908
17	6 59 29.65	2.3397	18 8 20.7	2.072	17	8 52 12.52	2.3453	14 27 47.8	7.002
18	7 1 50.06	2.3407	18 6 13.1	2.180	18	8 54 33.23	2.3449	14 20 44.9	7.094
19	7 4 10.53	2.3415	18 3 59.1	2.288	19	8 56 53.91	2.3444	14 13 36.5	7.186
20	7 6 31.04	2.3423	18 1 38.6	2.395	20	8 59 14.56	2.3438	14 6 22.6	7.277
21	7 8 51.60	2.3431	17 59 11.7	2.502	21	9 1 35.17	2.3433	13 59 3.2	7.368
22	7 11 12.21	2.3439	17 56 38.4	2.609	22	9 3 55.76	2.3429	13 51 38.4	7.458
23	7 13 32.87	2.3446	N. 17 53 58.6	2.717	23	9 6 16.32	2.3423	N. 13 44 8.2	7.548
SUNDAY 30.					TUESDAY, NOVEMBER 1.				
0	7 15 53.56	2.3458	N. 17 51 12.4	2.824	0	9 8 36.84	2.3418	N. 13 36 32.6	7.638
1	7 18 14.29	2.3458	17 48 19.7	2.932	PHASES OF THE MOON.				
2	7 20 35.06	2.3464	17 45 20.6	3.038					
3	7 22 55.86	2.3470	17 42 15.1	3.145					
4	7 25 16.70	2.3476	17 39 3.2	3.253					
5	7 27 37.57	2.3481	17 35 44.8	3.359	<div><div></div><div><div><div><div><sup>d</sup> <sup>h</sup> <sup>m</sup></div><div>☾ Last Quarter . . . . . Oct. 2 1 52.1</div><div>● New Moon . . . . . 8 17 24.9</div><div>☾ First Quarter . . . . . 15 17 54.2</div><div>○ Full Moon . . . . . 23 22 55.8</div><div>☾ Last Quarter . . . . . 31 11 13.3</div></div></div></div></div>				
6	7 29 58.47	2.3485	17 32 20.1	3.465					
7	7 32 19.39	2.3488	17 28 49.0	3.572					
8	7 34 40.33	2.3492	17 25 11.5	3.678					
9	7 37 1.30	2.3495	17 21 27.6	3.784	<div><div></div><div><div><div><div><sup>d</sup> <sup>h</sup></div><div>☾ Perigee . . . . . Oct. 7 18.1</div><div>☾ Apogee . . . . . 20 2.1</div></div></div></div></div>				
10	7 39 22.28	2.3498	17 17 37.4	3.890					
11	7 41 43.28	2.3502	17 13 40.8	3.996					
12	7 44 4.30	2.3504	17 9 37.9	4.101					
13	7 46 25.33	2.3506	17 5 28.7	4.206					
14	7 48 46.37	2.3508	17 1 13.2	4.311					
15	7 51 7.42	2.3509	16 56 51.4	4.416					
16	7 53 28.48	2.3510	16 52 23.3	4.520					
17	7 55 49.54	2.3511	16 47 49.0	4.624					
18	7 58 10.61	2.3512	16 43 8.4	4.728					
19	8 0 31.68	2.3512	16 38 21.6	4.831					
20	8 2 52.75	2.3512	16 33 28.7	4.933					
21	8 5 13.82	2.3511	16 28 29.6	5.037					
22	8 7 34.88	2.3510	16 23 24.3	5.140					
23	8 9 55.94	2.3509	16 18 12.8	5.242					
24	8 12 16.99	2.3508	N. 16 12 55.3	5.343					

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III <sup>h</sup>	P. L. of Diff.	VI <sup>h</sup>	P. L. of Diff.	IX <sup>h</sup>	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
1	JUPITER	W.	57 9 53	2600	58 48 48	2586	60 28 2	2572	62 7 35	2558
	α Arietis	W.	50 25 22	2852	51 58 43	2828	53 32 34	2806	55 6 54	2785
	Aldebaran	W.	16 4 21	2638	17 42 25	2624	19 20 48	2610	20 59 30	2596
	Regulus	E.	64 3 48	2641	62 25 49	2627	60 47 31	2613	59 8 54	2600
	SUN	E.	103 12 31	2977	101 41 50	2963	100 10 51	2947	98 39 32	2931
2	JUPITER	W.	70 30 18	2485	72 11 53	2470	73 53 48	2455	75 36 5	2439
	α Arietis	W.	63 5 28	2683	64 42 31	2663	66 20 1	2643	67 57 57	2624
	Aldebaran	W.	29 17 55	2522	30 58 38	2507	32 39 41	2492	34 21 5	2477
	Regulus	E.	50 51 1	2528	49 10 27	2513	47 29 32	2498	45 48 16	2483
	SUN	E.	90 58 5	2854	89 24 47	2838	87 51 8	2821	86 17 8	2805
3	JUPITER	W.	84 12 56	2362	85 57 25	2346	87 42 17	2331	89 27 31	2315
	α Arietis	W.	76 13 56	2534	77 54 22	2517	79 35 12	2499	81 16 26	2482
	Aldebaran	W.	42 53 34	2399	44 37 10	2383	46 21 9	2368	48 5 30	2352
	Regulus	E.	37 16 40	2408	35 33 16	2394	33 49 32	2379	32 5 27	2364
	SUN	E.	78 21 44	2722	76 45 33	2705	75 9 0	2689	73 32 5	2672
4	JUPITER	W.	98 19 22	2239	100 6 52	2224	101 54 44	2209	103 42 58	2193
	α Arietis	W.	89 48 24	2403	91 31 54	2388	93 15 46	2374	94 59 58	2359
	Aldebaran	W.	56 52 56	2275	58 39 32	2260	60 26 31	2245	62 13 51	2231
	SUN	E.	65 21 53	2590	63 42 44	2574	62 3 13	2558	60 23 20	2543
5	Aldebaran	W.	71 15 53	2161	73 5 19	2149	74 55 4	2136	76 45 8	2124
	SUN	E.	51 58 45	2470	50 16 49	2457	48 34 35	2443	46 52 2	2431
6	Aldebaran	W.	85 59 53	2071	87 51 37	2061	89 43 36	2053	91 35 48	2045
	SUN	E.	38 15 7	2377	36 30 59	2368	34 46 39	2360	33 2 7	2353
10	SUN	W.	18 7 39	2455	19 49 56	2466	21 31 57	2477	23 13 43	2489
	α Aquilæ	E.	84 36 59	2567	82 57 19	2583	81 18 0	2601	79 39 6	2620
	SATURN	E.	99 58 30	2127	98 8 12	2140	96 18 14	2153	94 28 36	2167
11	SUN	W.	31 38 4	2561	33 17 53	2577	34 57 19	2594	36 36 22	2611
	α Aquilæ	E.	71 31 46	2738	69 55 57	2766	68 20 45	2796	66 46 12	2828
	SATURN	E.	85 25 53	2244	83 38 31	2261	81 51 34	2278	80 5 1	2295
	Fomalhaut	E.	104 10 37	2601	102 31 42	2612	100 53 3	2624	99 14 41	2638
12	SUN	W.	44 45 27	2706	46 21 59	2725	47 58 5	2745	49 33 45	2764
	α Aquilæ	E.	59 4 22	3013	57 34 25	3056	56 5 22	3102	54 37 15	3152
	SATURN	E.	71 18 47	2386	69 34 52	2405	67 51 24	2423	66 8 22	2443
	Fomalhaut	E.	91 7 50	2719	89 31 35	2738	87 55 46	2756	86 20 21	2776
	α Pegasi	E.	105 58 14	2659	104 20 39	2673	102 43 23	2688	101 6 27	2704
13	SUN	W.	57 25 35	2866	58 58 38	2885	60 31 16	2905	62 3 29	2924
	α Aquilæ	E.	47 32 30	3446	46 11 6	3519	44 51 3	3597	43 32 25	3680
	SATURN	E.	57 40 1	2539	55 59 42	2558	54 19 49	2577	52 40 23	2596
	Fomalhaut	E.	78 30 5	2886	76 57 28	2909	75 25 21	2933	73 53 44	2958
	α Pegasi	E.	93 7 10	2789	91 32 28	2807	89 58 9	2825	88 24 14	2844
14	SUN	W.	69 38 21	3022	71 8 7	3041	72 37 29	3059	74 6 29	3077
	SATURN	E.	44 29 43	2692	42 52 52	2710	41 16 26	2729	39 40 25	2748

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XV <sup>h</sup>	P. L. of Diff.	XVIII <sup>h</sup>	P. L. of Diff.	XXI <sup>h</sup>	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
1	JUPITER W.	63 47 28	2544	65 27 40	2530	67 8 12	2515	68 49 5	2500
	α Arietis W.	56 41 41	2763	58 16 57	2743	59 52 40	2722	61 28 51	2702
	Aldebaran W.	22 38 31	2582	24 17 51	2566	25 57 32	2552	27 37 33	2537
	Regulus E.	57 29 59	2585	55 50 44	2572	54 11 10	2557	52 31 16	2542
	SUN E.	97 7 53	2917	95 35 56	2901	94 3 39	2886	92 31 2	2870
2	JUPITER W.	77 18 44	2424	79 1 44	2409	80 45 6	2394	82 28 50	2378
	α Arietis W.	69 36 19	2606	71 15 6	2588	72 54 17	2569	74 33 54	2551
	Aldebaran W.	36 2 51	2462	37 44 58	2445	39 27 28	2430	41 10 20	2415
	Regulus E.	44 6 39	2468	42 24 41	2453	40 42 22	2438	38 59 42	2423
	SUN E.	84 42 47	2788	83 8 4	2772	81 32 59	2756	79 57 33	2738
3	JUPITER W.	91 13 8	2300	92 59 8	2285	94 45 30	2269	96 32 15	2254
	α Arietis W.	82 58 4	2466	84 40 5	2450	86 22 29	2434	88 5 15	2418
	Aldebaran W.	49 50 14	2336	51 35 21	2321	53 20 50	2305	55 6 42	2290
	Regulus E.	30 21 1	2350	28 36 15	2337	26 51 9	2323	25 5 43	2309
	SUN E.	71 54 47	2655	70 17 7	2639	68 39 5	2622	67 0 40	2606
4	JUPITER W.	105 31 33	2180	107 20 30	2167	109 9 48	2153	110 59 27	2139
	α Arietis W.	96 44 31	2346	98 29 23	2334	100 14 33	2322	102 0 1	2309
	Aldebaran W.	64 1 33	2216	65 49 37	2202	67 38 1	2188	69 26 47	2174
	SUN E.	58 43 7	2527	57 2 32	2513	55 21 37	2498	53 40 21	2484
5	Aldebaran W.	78 35 31	2112	80 26 12	2101	82 17 9	2090	84 8 23	2080
	SUN E.	45 9 11	2419	43 26 4	2408	41 42 40	2397	39 59 1	2387
6	Aldebaran W.	93 28 12	2037	95 20 48	2031	97 13 34	2025	99 6 29	2019
	SUN E.	31 17 25	2346	29 32 33	2342	27 47 34	2337	26 2 28	2333
10	SUN W.	24 55 12	2500	26 36 25	2514	28 17 19	2529	29 57 52	2544
	α Aquilæ E.	78 0 38	2641	76 22 39	2663	74 45 9	2687	73 8 11	2711
	SATURN E.	92 39 18	2181	90 50 22	2197	89 1 50	2212	87 13 40	2227
11	SUN W.	38 15 2	2629	39 53 17	2649	41 31 5	2667	43 8 29	2687
	α Aquilæ E.	65 12 21	2861	63 39 12	2895	62 6 47	2933	60 35 10	2972
	SATURN E.	78 18 54	2313	76 33 13	2331	74 47 58	2348	73 3 9	2367
	Fomalhaut E.	97 36 37	2652	95 58 53	2668	94 21 30	2684	92 44 29	2701
12	SUN W.	51 9 0	2785	52 43 48	2805	54 18 9	2825	55 52 5	2845
	α Aquilæ E.	53 10 8	3204	51 44 3	3258	50 19 2	3317	48 55 10	3379
	SATURN E.	64 25 48	2462	62 43 41	2481	61 2 1	2500	59 20 48	2519
	Fomalhaut E.	84 45 22	2798	83 10 51	2818	81 36 47	2840	80 3 11	2863
	α Pegasi E.	99 29 52	2720	97 53 39	2736	96 17 47	2753	94 42 17	2770
13	SUN W.	63 35 17	2945	65 6 39	2964	66 37 37	2983	68 8 11	3002
	α Aquilæ E.	42 15 17	3771	40 59 45	3871	39 45 56	3980	38 33 57	4098
	SATURN E.	51 1 23	2616	49 22 50	2635	47 44 42	2654	46 7 0	2672
	Fomalhaut E.	72 22 38	2983	70 52 4	3009	69 22 2	3035	67 52 33	3063
	α Pegasi E.	86 50 43	2863	85 17 37	2883	83 44 56	2902	82 12 40	2922
14	SUN W.	75 35 7	3095	77 3 23	3113	78 31 17	3129	79 58 51	3146
	SATURN E.	38 4 49	2766	36 29 37	2785	34 54 49	2804	33 20 26	2822

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
14	Fomalhaut E.	66 23 38	3091	64 55 17	3119	63 27 30	3148	62 0 19	3178
	α Pegasi E.	80 40 49	2942	79 9 24	2962	77 38 24	2983	76 7 50	3003
	JUPITER E.	115 31 52	2629	113 53 36	2646	112 15 44	2663	110 38 14	2679
	α Arietis E.	124 12 35	2858	122 39 22	2868	121 6 22	2880	119 33 37	2891
15	SUN W.	81 26 5	3163	82 52 58	3179	84 19 32	3195	85 45 47	3210
	Antares W.	35 51 53	2982	37 22 28	2985	38 53 0	2989	40 23 27	2993
	Fomalhaut E.	54 53 43	3345	53 30 24	3382	52 7 47	3422	50 45 55	3463
	α Pegasi E.	68 41 28	3110	67 13 31	3132	65 46 0	3154	64 18 56	3177
	JUPITER E.	102 36 8	2757	101 0 44	2772	99 25 40	2786	97 50 54	2800
	α Arietis E.	111 53 31	2950	110 22 15	2962	108 51 14	2973	107 20 28	2985
16	SUN W.	92 52 39	3282	94 17 12	3294	95 41 31	3306	97 5 35	3318
	Antares W.	47 54 8	3022	49 23 53	3029	50 53 30	3035	52 22 59	3042
	Fomalhaut E.	44 8 50	3707	42 52 10	3767	41 36 33	3830	40 22 2	3899
	α Pegasi E.	57 10 32	3297	55 46 17	3324	54 22 33	3351	52 59 21	3379
	JUPITER E.	90 1 26	2864	88 28 21	2876	86 55 31	2887	85 22 55	2897
	α Arietis E.	99 50 11	3041	98 20 49	3052	96 51 41	3062	95 22 45	3072
17	SUN W.	104 2 41	3371	105 25 31	3380	106 48 10	3389	108 10 39	3397
	Antares W.	59 48 23	3074	61 17 4	3080	62 45 38	3085	64 14 6	3091
	α Pegasi E.	46 11 41	3540	44 52 1	3577	43 33 2	3618	42 14 47	3663
	JUPITER E.	77 43 7	2944	76 11 44	2953	74 40 32	2960	73 9 29	2968
	α Arietis E.	88 1 5	3119	86 33 19	3128	85 5 43	3136	83 38 17	3144
	Aldebaran E.	120 51 54	2991	119 21 30	2999	117 51 16	3007	116 21 12	3014
18	SUN W.	115 0 58	3431	116 22 40	3437	117 44 15	3441	119 5 45	3446
	Antares W.	71 34 53	3113	73 2 47	3117	74 30 36	3120	75 58 21	3123
	JUPITER E.	65 36 20	2997	64 6 4	3001	62 35 53	3006	61 5 48	3010
	α Arietis E.	76 23 27	3181	74 56 55	3187	73 30 30	3193	72 4 13	3200
	Aldebaran E.	108 52 56	3044	107 23 38	3049	105 54 26	3053	104 25 19	3057
19	Antares W.	83 16 20	3133	84 43 49	3134	86 11 17	3135	87 38 44	3136
	α Aquilæ W.	40 38 3	4269	41 45 24	4203	42 53 47	4142	44 3 8	4086
	SATURN W.	17 24 51	3184	18 51 19	3172	20 18 2	3160	21 44 59	3150
	JUPITER E.	53 36 24	3023	52 6 40	3026	50 36 59	3026	49 7 19	3027
	α Arietis E.	64 54 38	3229	63 29 3	3235	62 3 35	3240	60 38 13	3246
	Aldebaran E.	97 0 46	3070	95 32 0	3072	94 3 16	3073	92 34 34	3073
20	Antares W.	94 55 52	3135	96 23 19	3134	97 50 47	3133	99 18 16	3132
	α Aquilæ W.	50 1 59	3872	51 15 47	3838	52 30 10	3806	53 45 6	3777
	SATURN W.	29 2 11	3118	30 29 59	3113	31 57 53	3108	33 25 53	3103
	JUPITER E.	41 39 6	3026	40 9 26	3026	38 39 45	3024	37 10 2	3023
	α Arietis E.	53 33 9	3276	52 8 30	3283	50 43 59	3292	49 19 38	3300
	Aldebaran E.	85 11 6	3073	83 42 23	3071	82 13 38	3069	80 44 51	3068
21	Antares W.	106 36 12	3123	108 3 54	3120	109 31 39	3118	110 59 27	3115
	α Aquilæ W.	60 6 47	3656	61 24 21	3636	62 42 16	3616	64 0 33	3598
	SATURN W.	40 47 17	3080	42 15 51	3076	43 44 30	3071	45 13 15	3065
	JUPITER E.	29 40 55	3011	28 10 56	3009	26 40 55	3006	25 10 50	3003
	α Arietis E.	42 20 32	3355	40 57 24	3370	39 34 33	3386	38 12 1	3405
	Aldebaran E.	73 20 16	3055	71 51 11	3051	70 22 1	3047	68 52 46	3043

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
14	Fomalhaut E.	60 33 43	3209	59 7 44	3242	57 42 24	3275	56 17 43	3310
	α Pegasi E.	74 37 41	3025	73 7 59	3045	71 38 42	3067	70 9 52	3088
	JUPITER E.	109 1 6	2695	107 24 20	2712	105 47 56	2727	104 11 52	2742
	α Arietis E.	118 1 6	2902	116 28 50	2914	114 56 49	2925	113 25 2	2938
15	SUN W.	87 11 44	3225	88 37 23	3240	90 2 45	3254	91 27 50	3268
	Antares W.	41 53 49	2998	43 24 4	3003	44 54 13	3009	46 24 14	3015
	Fomalhaut E.	49 24 49	3506	48 4 31	3552	46 45 4	3599	45 26 29	3651
	α Pegasi E.	62 52 19	3199	61 26 9	3224	60 0 28	3248	58 35 16	3272
	JUPITER E.	96 16 26	2814	94 42 16	2827	93 8 23	2839	91 34 46	2852
	α Arietis E.	105 49 56	2997	104 19 39	3009	102 49 36	3019	101 19 47	3030
16	SUN W.	98 29 26	3330	99 53 3	3340	101 16 28	3351	102 39 40	3361
	Antares W.	53 52 20	3049	55 21 32	3055	56 50 37	3061	58 19 34	3068
	Fomalhaut E.	39 8 41	3974	37 56 36	4058	36 45 53	4149	35 36 38	4248
	α Pegasi E.	51 36 40	3408	50 14 32	3438	48 52 58	3471	47 32 1	3504
	JUPITER E.	83 50 32	2908	82 18 23	2917	80 46 26	2927	79 14 41	2935
	α Arietis E.	93 54 1	3082	92 25 30	3091	90 57 10	3101	89 29 2	3110
17	SUN W.	109 32 59	3405	110 55 10	3411	112 17 14	3418	113 39 10	3425
	Antares W.	65 42 27	3096	67 10 42	3101	68 38 51	3105	70 6 55	3110
	α Pegasi E.	40 57 20	3709	39 40 43	3760	38 24 59	3816	37 10 13	3878
	JUPITER E.	71 38 36	2974	70 7 51	2980	68 37 13	2986	67 6 43	2992
	α Arietis E.	82 11 1	3152	80 43 54	3160	79 16 57	3167	77 50 8	3173
	Aldebaran E.	114 51 17	3021	113 21 30	3028	111 51 52	3034	110 22 21	3039
18	SUN W.	120 27 10	3450	121 48 30	3454	123 9 46	3457	124 30 58	3460
	Antares W.	77 26 3	3126	78 53 41	3129	80 21 16	3130	81 48 49	3134
	JUPITER E.	59 35 48	3014	58 5 52	3017	56 36 0	3019	55 6 11	3021
	α Arietis E.	70 38 4	3206	69 12 2	3212	67 46 7	3218	66 20 19	3224
	Aldebaran E.	102 56 17	3060	101 27 19	3064	99 58 25	3066	98 29 34	3069
19	Antares W.	89 6 10	3136	90 33 36	3138	92 1 0	3136	93 28 26	3136
	α Aquilæ W.	45 13 23	4036	46 24 27	3990	47 36 16	3947	48 48 48	3909
	SATURN W.	23 12 8	3142	24 39 27	3135	26 6 54	3129	27 34 29	3123
	JUPITER E.	47 37 40	3027	46 8 1	3028	44 38 23	3028	43 8 45	3027
	α Arietis E.	59 12 58	3252	57 47 50	3258	56 22 49	3264	54 57 55	3270
	Aldebaran E.	91 5 52	3074	89 37 11	3074	88 8 30	3073	86 39 48	3073
20	Antares W.	100 45 47	3130	102 13 20	3129	103 40 55	3127	105 8 32	3124
	α Aquilæ W.	55 0 32	3750	56 16 26	3725	57 32 47	3699	58 49 35	3677
	SATURN W.	34 53 59	3099	36 22 10	3095	37 50 26	3089	39 18 49	3085
	JUPITER E.	35 40 18	3021	34 10 31	3019	32 40 42	3017	31 10 50	3014
	α Arietis E.	47 55 26	3308	46 31 24	3319	45 7 34	3329	43 43 56	3341
	Aldebaran E.	79 16 2	3065	77 47 10	3064	76 18 16	3060	74 49 18	3057
21	Antares W.	112 27 18	3113	113 55 12	3110	115 23 9	3107	116 51 10	3105
	α Aquilæ W.	65 19 9	3582	66 38 3	3565	67 57 16	3549	69 16 46	3534
	SATURN W.	46 42 7	3061	48 11 4	3056	49 40 8	3050	51 9 19	3045
	JUPITER E.	23 40 41	3001	22 10 29	2997	20 40 13	2995	19 9 54	2991
	α Arietis E.	36 49 50	3427	35 28 4	3454	34 6 48	3482	32 46 4	3514
	Aldebaran E.	67 23 27	3039	65 54 3	3035	64 24 34	3030	62 54 59	3026

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
22	$\alpha$ Aquilæ W.	70 36 33	3520	71 56 35	3507	73 16 51	3494	74 37 22	3481
	SATURN W.	52 38 36	3039	54 8 0	3034	55 37 31	3028	57 7 9	3022
	Aldebaran E.	61 25 18	3021	59 55 31	3015	58 25 37	3010	56 55 37	3005
	Pollux E.	104 58 54	3105	103 30 51	3099	102 2 41	3093	100 34 23	3087
23	$\alpha$ Aquilæ W.	81 23 10	3429	82 44 54	3419	84 6 49	3410	85 28 54	3402
	SATURN W.	64 37 12	2992	66 7 35	2985	67 38 7	2978	69 8 47	2971
	Aldebaran E.	49 23 53	2976	47 53 10	2970	46 22 20	2963	44 51 21	2957
	Pollux E.	93 11 2	3056	91 41 58	3049	90 12 46	3043	88 43 26	3037
24	$\alpha$ Aquilæ W.	92 21 27	3368	93 44 20	3363	95 7 19	3358	96 30 24	3354
	SATURN W.	76 44 14	2938	78 15 45	2931	79 47 25	2924	81 19 14	2916
	Aldebaran E.	37 14 23	2924	35 42 34	2916	34 10 36	2909	32 38 29	2903
	Pollux E.	81 14 51	3005	79 44 44	2999	78 14 30	2993	76 44 8	2987
25	$\alpha$ Aquilæ W.	103 26 47	3341	104 50 11	3340	106 13 36	3341	107 37 0	3342
	SATURN W.	89 0 38	2880	90 33 23	2873	92 6 17	2865	93 39 21	2858
	JUPITER W.	19 21 24	2831	20 55 11	2824	22 29 8	2815	24 3 17	2805
	Pollux E.	69 10 27	2958	67 39 21	2953	66 8 9	2947	64 36 50	2942
26	SATURN W.	101 27 6	2820	103 1 8	2811	104 35 21	2804	106 9 44	2796
	JUPITER W.	31 56 50	2764	33 32 5	2756	35 7 31	2747	36 43 8	2739
	$\alpha$ Arietis W.	24 30 6	3625	25 48 13	3531	27 8 3	3447	28 29 26	3375
	Pollux E.	56 58 42	2920	55 26 48	2916	53 54 50	2913	52 22 48	2911
	Regulus E.	92 32 54	2808	90 58 36	2799	89 24 7	2792	87 49 28	2783
27	JUPITER W.	44 43 56	2698	46 20 39	2689	47 57 33	2681	49 34 39	2672
	$\alpha$ Arietis W.	35 34 1	3124	37 1 41	3088	38 30 5	3056	39 59 9	3026
	Pollux E.	44 42 2	2907	43 9 52	2909	41 37 44	2912	40 5 40	2916
	Regulus E.	79 53 32	2742	78 17 48	2734	76 41 53	2725	75 5 47	2716
28	JUPITER W.	57 43 5	2628	59 21 21	2619	60 59 50	2610	62 38 32	2601
	$\alpha$ Arietis W.	47 32 59	2904	49 5 13	2883	50 37 53	2863	52 10 59	2845
	Aldebaran W.	13 5 32	2671	14 42 51	2662	16 20 22	2652	17 58 6	2643
	Regulus E.	67 2 22	2673	65 25 6	2664	63 47 38	2655	62 9 57	2646
29	JUPITER W.	70 55 11	2553	72 35 10	2543	74 15 23	2533	75 55 50	2524
	$\alpha$ Arietis W.	60 2 5	2763	61 37 21	2748	63 12 57	2733	64 48 53	2719
	Aldebaran W.	26 10 1	2595	27 49 3	2585	29 28 19	2574	31 7 49	2564
	Regulus E.	53 58 25	2599	52 19 28	2589	50 40 18	2579	49 0 54	2569
	SUN E.	120 47 3	2949	119 15 46	2937	117 44 14	2926	116 12 28	2915
30	JUPITER W.	84 21 31	2472	86 3 23	2462	87 45 29	2452	89 27 50	2441
	$\alpha$ Arietis W.	72 53 10	2651	74 30 56	2639	76 8 58	2626	77 47 18	2614
	Aldebaran W.	39 28 50	2513	41 9 45	2502	42 50 56	2491	44 32 22	2481
	Regulus E.	40 40 32	2520	38 59 47	2510	37 18 47	2499	35 37 33	2489
	SUN E.	108 30 6	2859	106 56 54	2847	105 23 28	2835	103 49 46	2824
31	JUPITER W.	98 3 22	2387	99 47 15	2376	101 31 23	2365	103 15 48	2355
	$\alpha$ Arietis W.	86 3 6	2554	87 43 4	2543	89 23 18	2531	91 3 48	2521
	Aldebaran W.	53 3 17	2426	54 46 14	2415	56 29 28	2404	58 12 58	2393
	SUN E.	95 57 30	2765	94 22 17	2753	92 46 48	2741	91 11 3	2729

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
22	$\alpha$ Aquilæ W.	75 58 7	3471	77 19 4	3459	78 40 14	3448	80 1 36	3438
	SATURN W.	58 36 55	3016	60 6 48	3010	61 36 48	3004	63 6 56	2997
	Aldebaran E.	55 25 30	2999	53 55 16	2994	52 24 56	2988	50 54 28	2982
	Pollux E.	99 5 58	3081	97 37 26	3075	96 8 46	3069	94 39 58	3062
23	$\alpha$ Aquilæ W.	86 51 8	3394	88 13 31	3387	89 36 2	3380	90 58 41	3374
	SATURN W.	70 39 36	2965	72 10 33	2958	73 41 38	2951	75 12 52	2945
	Aldebaran E.	43 20 14	2950	41 48 59	2944	40 17 36	2937	38 46 4	2930
	Pollux E.	87 13 59	3030	85 44 24	3024	84 14 41	3018	82 44 50	3011
24	$\alpha$ Aquilæ W.	97 53 33	3350	99 16 47	3347	100 40 4	3345	102 3 24	3342
	SATURN W.	82 51 13	2909	84 23 20	2901	85 55 37	2894	87 28 3	2887
	Aldebaran E.	31 6 14	2895	29 33 49	2888	28 1 15	2881	26 28 32	2873
	Pollux E.	75 13 39	2981	73 43 2	2975	72 12 18	2969	70 41 26	2963
25	$\alpha$ Aquilæ W.	109 0 23	3344	110 23 44	3347	111 47 1	3351	113 10 14	3355
	SATURN W.	95 12 34	2850	96 45 57	2842	98 19 30	2835	99 53 13	2827
	JUPITER W.	25 37 38	2797	27 12 10	2789	28 46 52	2780	30 21 46	2772
	Pollux E.	63 5 24	2937	61 33 52	2932	60 2 14	2928	58 30 31	2924
26	SATURN W.	107 44 17	2788	109 19 0	2780	110 53 54	2772	112 28 58	2764
	JUPITER W.	38 18 56	2731	39 54 55	2723	41 31 4	2715	43 7 24	2706
	$\alpha$ Arietis W.	29 52 11	3313	31 16 8	3257	32 41 10	3209	34 7 9	3164
	Pollux E.	50 50 43	2909	49 18 34	2907	47 46 24	2906	46 14 13	2906
	Regulus E.	86 14 38	2775	84 39 38	2767	83 4 27	2759	81 29 5	2750
27	JUPITER W.	51 11 57	2663	52 49 26	2655	54 27 7	2646	56 5 0	2637
	$\alpha$ Arietis W.	41 28 50	2998	42 59 5	2972	44 29 53	2948	46 1 12	2925
	Pollux E.	38 33 41	2922	37 1 50	2931	35 30 10	2942	33 58 43	2953
	Regulus E.	73 29 29	2708	71 53 0	2699	70 16 19	2690	68 39 26	2682
28	JUPITER W.	64 17 26	2592	65 56 33	2582	67 35 52	2572	69 15 25	2563
	$\alpha$ Arietis W.	53 44 28	2828	55 18 19	2811	56 52 33	2794	58 27 9	2779
	Aldebaran W.	19 36 3	2633	21 14 13	2624	22 52 35	2614	24 31 11	2604
	Regulus E.	60 32 4	2636	58 53 58	2627	57 15 40	2618	55 37 9	2608
29	JUPITER W.	77 36 30	2514	79 17 24	2504	80 58 32	2494	82 39 54	2483
	$\alpha$ Arietis W.	66 25 8	2705	68 1 41	2692	69 38 32	2678	71 15 42	2664
	Aldebaran W.	32 47 33	2554	34 27 31	2544	36 7 43	2534	37 48 9	2523
	Regulus E.	47 21 17	2559	45 41 26	2550	44 1 22	2540	42 21 4	2530
	SUN E.	114 40 28	2904	113 8 14	2893	111 35 46	2881	110 3 3	2870
30	JUPITER W.	91 10 26	2431	92 53 17	2420	94 36 23	2409	96 19 45	2398
	$\alpha$ Arietis W.	79 25 54	2601	81 4 47	2589	82 43 57	2577	84 23 23	2565
	Aldebaran W.	46 14 2	2470	47 55 57	2459	49 38 8	2448	51 20 35	2437
	Regulus E.	33 56 5	2480	32 14 23	2470	30 32 27	2460	28 50 17	2450
	SUN E.	102 15 50	2812	100 41 38	2801	99 7 11	2789	97 32 28	2777
31	JUPITER W.	105 0 28	2344	106 45 24	2333	108 30 35	2322	110 16 3	2311
	$\alpha$ Arietis W.	92 44 32	2510	94 25 31	2499	96 6 45	2489	97 48 14	2479
	Aldebaran W.	59 56 43	2382	61 40 44	2371	63 25 1	2359	65 9 34	2348
	SUN E.	89 35 2	2718	87 58 46	2706	86 22 14	2694	84 45 26	2682

## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ' "	"	' "	s	m s	s
Tues.	1	14 24 59.64	9.791	S. 14 23 5.7	- 48.19	16 9.17	66.88	16 19.93	0.005
Wed.	2	14 28 55.03	9.825	14 42 15.5	47.61	16 9.41	67.00	16 21.09	0.031
Thur.	3	14 32 51.25	9.860	15 1 11.1	47.01	16 9.65	67.11	16 21.42	0.004
Frid.	4	14 36 48.31	9.895	15 19 52.0	- 46.39	16 9.89	67.23	16 20.92	0.038
Sat.	5	14 40 46.20	9.930	15 38 17.9	45.76	16 10.13	67.34	16 19.59	0.073
SUN.	6	14 44 44.93	9.965	15 56 28.4	45.11	16 10.37	67.46	16 17.42	0.108
Mon.	7	14 48 44.52	10.000	16 14 22.9	- 44.43	16 10.60	67.58	16 14.40	0.143
Tues.	8	14 52 44.93	10.035	16 32 1.1	43.74	16 10.83	67.70	16 10.54	0.178
Wed.	9	14 56 46.19	10.070	16 49 22.6	43.04	16 11.06	67.82	16 5.85	0.213
Thur.	10	15 0 48.29	10.105	17 6 27.0	- 42.31	16 11.30	67.94	16 0.32	0.248
Frid.	11	15 4 51.24	10.140	17 23 13.7	41.57	16 11.54	68.06	15 53.94	0.283
Sat.	12	15 8 55.01	10.175	17 39 42.5	40.82	16 11.77	68.18	15 46.74	0.317
SUN.	13	15 12 59.62	10.209	17 55 52.9	- 40.04	16 12.00	68.30	15 38.71	0.352
Mon.	14	15 17 5.06	10.244	18 11 44.5	39.25	16 12.22	68.42	15 29.85	0.386
Tues.	15	15 21 11.34	10.279	18 27 16.8	38.44	16 12.43	68.54	15 20.16	0.421
Wed.	16	15 25 18.44	10.313	18 42 29.7	- 37.62	16 12.65	68.66	15 9.63	0.456
Thur.	17	15 29 26.37	10.347	18 57 22.5	36.78	16 12.86	68.78	14 58.29	0.490
Frid.	18	15 33 35.12	10.381	19 11 55.1	35.92	16 13.07	68.89	14 46.13	0.524
Sat.	19	15 37 44.69	10.415	19 26 6.8	- 35.05	16 13.28	69.01	14 33.15	0.557
SUN.	20	15 41 55.06	10.449	19 39 57.5	34.17	16 13.48	69.12	14 19.38	0.591
Mon.	21	15 46 6.25	10.483	19 53 26.8	33.26	16 13.67	69.23	14 4.78	0.625
Tues.	22	15 50 18.24	10.516	20 6 34.2	- 32.34	16 13.86	69.34	13 49.39	0.658
Wed.	23	15 54 31.02	10.549	20 19 19.5	31.41	16 14.05	69.45	13 33.22	0.690
Thur.	24	15 58 44.58	10.581	20 31 42.2	30.47	16 14.23	69.55	13 16.26	0.723
Frid.	25	16 2 58.92	10.613	20 43 42.2	- 29.52	16 14.41	69.66	12 58.52	0.755
Sat.	26	16 7 14.03	10.645	20 55 19.0	28.54	16 14.58	69.76	12 40.01	0.787
SUN.	27	16 11 29.90	10.676	21 6 32.3	27.56	16 14.75	69.86	12 20.76	0.818
Mon.	28	16 15 46.50	10.707	21 17 21.7	- 26.56	16 14.91	69.96	12 0.77	0.848
Tues.	29	16 20 3.84	10.737	21 27 47.1	25.55	16 15.06	70.06	11 40.04	0.878
Wed.	30	16 24 21.89	10.766	21 37 48.0	24.53	16 15.21	70.15	11 18.61	0.907
Thur.	31	16 28 40.63	10.795	S. 21 47 24.3	- 23.49	16 15.37	70.24	10 56.49	0.936

NOTE.—The mean time of semidiameter passing the meridian may be found by subtracting 0<sup>h</sup>.19 from the sidereal time.  
The sign - prefixed to the hourly change of declination indicates that south declinations are increasing.



AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ' "	"	m s	s	h m s
Tues.	1	14 25 2.30	9.791	S. 14 23 18.9	-48.19	16 19.95	0.065	14 41 22.25
Wed.	2	14 28 57.71	9.826	14 42 28.5	47.60	16 21.10	0.031	14 45 18.81
Thur.	3	14 32 53.94	9.860	15 1 23.9	47.01	16 21.42	0.004	14 49 15.36
Frid.	4	14 36 51.00	9.895	15 20 4.7	-46.39	16 20.91	0.038	14 53 11.92
Sat.	5	14 40 48.90	9.930	15 38 30.4	45.75	16 19.57	0.073	14 57 8.47
SUN.	6	14 44 47.64	9.965	15 56 40.6	45.09	16 17.39	0.108	15 1 5.02
Mon.	7	14 48 47.23	10.000	16 14 34.9	-44.42	16 14.36	0.144	15 5 1.58
Tues.	8	14 52 47.64	10.035	16 32 12.9	43.74	16 10.49	0.179	15 8 58.13
Wed.	9	14 56 48.89	10.070	16 49 34.2	43.04	16 5.79	0.213	15 12 54.69
Thur.	10	15 0 50.99	10.105	17 6 38.2	-42.31	16 0.25	0.248	15 16 51.24
Frid.	11	15 4 53.92	10.140	17 23 24.7	41.56	15 53.87	0.283	15 20 47.80
Sat.	12	15 8 57.69	10.174	17 39 53.2	40.80	15 46.66	0.318	15 24 44.35
SUN.	13	15 13 2.28	10.209	17 56 3.3	-40.03	15 38.62	0.352	15 28 40.90
Mon.	14	15 17 7.71	10.243	18 11 54.6	39.24	15 29.75	0.387	15 32 37.46
Tues.	15	15 21 13.96	10.278	18 27 26.7	38.43	15 20.05	0.422	15 36 34.02
Wed.	16	15 25 21.05	10.312	18 42 39.2	-37.61	15 9.52	0.456	15 40 30.57
Thur.	17	15 29 28.95	10.346	18 57 31.7	36.77	14 58.17	0.490	15 44 27.13
Frid.	18	15 33 37.67	10.380	19 12 3.9	35.91	14 46.00	0.524	15 48 23.68
Sat.	19	15 37 47.21	10.414	19 26 15.3	-35.04	14 33.02	0.557	15 52 20.24
SUN.	20	15 41 57.56	10.448	19 40 5.7	34.15	14 19.24	0.591	15 56 16.79
Mon.	21	15 46 8.71	10.481	19 53 34.6	33.25	14 4.64	0.625	16 0 13.35
Tues.	22	15 50 20.66	10.514	20 6 41.6	-32.34	13 49.24	0.658	16 4 9.90
Wed.	23	15 54 33.40	10.547	20 19 26.6	31.41	13 33.06	0.690	16 8 6.46
Thur.	24	15 58 46.92	10.580	20 31 49.0	30.46	13 16.10	0.723	16 12 3.02
Frid.	25	16 3 1.21	10.612	20 43 48.6	-29.50	12 58.36	0.755	16 15 59.57
Sat.	26	16 7 16.28	10.643	20 55 25.0	28.53	12 39.85	0.787	16 19 56.13
SUN.	27	16 11 32.09	10.674	21 6 37.9	27.55	12 20.59	0.818	16 23 52.68
Mon.	28	16 15 48.65	10.705	21 17 27.0	-26.55	12 0.60	0.848	16 27 49.24
Tues.	29	16 20 5.93	10.735	21 27 52.1	25.54	11 39.87	0.878	16 31 45.80
Wed.	30	16 24 23.92	10.764	21 37 52.6	24.52	11 18.44	0.907	16 35 42.35
Thur.	31	16 28 42.60	10.792	S. 21 47 28.6	-23.48	10 56.32	0.936	16 39 38.91

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.  
The sign — prefixed to the hourly change of declination indicates that south declinations are increasing.

Diff. for 1 Hour,  
+ 9<sup>s</sup>.8565.  
(Table III.)

AT GREENWICH MEAN NOON.									
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.	
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.				
		$\lambda$	$\lambda'$						
		$^{\circ}$ $'$ $''$	$^{\circ}$ $'$ $''$	$''$	$''$			$^h$ $^m$ $^s$	
1	306	218 38 55.2	38 19.0	150.20	+ 0.07	9.996 5491	- 45.5	9 17 6.23	
2	307	219 39 1.2	38 24.9	150.29	0.19	9.996 4404	45.1	9 13 10.32	
3	308	220 39 9.4	38 33.0	150.38	0.33	9.996 3325	44.8	9 9 14.41	
4	309	221 39 19.6	38 43.1	150.47	+ 0.46	9.996 2253	- 44.5	9 5 18.50	
5	310	222 39 31.9	38 55.3	150.55	0.59	9.996 1187	44.3	9 1 22.60	
6	311	223 39 46.2	39 9.4	150.63	0.71	9.996 0127	44.1	8 57 26.69	
7	312	224 40 2.3	39 25.4	150.71	+ 0.80	9.995 9071	- 43.9	8 53 30.78	
8	313	225 40 20.2	39 43.2	150.78	0.86	9.995 8021	43.6	8 49 34.87	
9	314	226 40 39.7	40 2.6	150.85	0.90	9.995 6977	43.4	8 45 38.96	
10	315	227 41 0.9	40 23.6	150.91	+ 0.90	9.995 5939	- 43.1	8 41 43.05	
11	316	228 41 23.6	40 46.2	150.97	0.87	9.995 4910	42.7	8 37 47.14	
12	317	229 41 47.7	41 10.1	151.03	0.82	9.995 3889	42.3	8 33 51.24	
13	318	230 42 13.2	41 35.5	151.09	+ 0.74	9.995 2879	- 41.8	8 29 55.32	
14	319	231 42 40.1	42 2.3	151.15	0.64	9.995 1882	41.3	8 25 59.42	
15	320	232 43 8.3	42 30.4	151.20	0.54	9.995 0899	40.7	8 22 3.51	
16	321	233 43 37.8	42 59.8	151.26	+ 0.42	9.994 9931	- 40.0	8 18 7.60	
17	322	234 44 8.7	43 30.5	151.31	0.30	9.994 8979	39.3	8 14 11.69	
18	323	235 44 40.8	44 2.5	151.37	0.17	9.994 8045	38.5	8 10 15.78	
19	324	236 45 14.3	44 35.8	151.42	+ 0.06	9.994 7129	- 37.7	8 6 19.87	
20	325	237 45 49.0	45 10.4	151.48	- 0.04	9.994 6233	36.9	8 2 23.96	
21	326	238 46 25.1	45 46.4	151.53	0.11	9.994 5359	36.0	7 58 28.05	
22	327	239 47 2.6	46 23.6	151.59	- 0.17	9.994 4505	- 35.1	7 54 32.14	
23	328	240 47 41.4	47 2.3	151.65	0.20	9.994 3674	34.1	7 50 36.23	
24	329	241 48 21.6	47 42.4	151.71	0.20	9.994 2866	33.2	7 46 40.32	
25	330	242 49 3.2	48 23.9	151.77	- 0.18	9.994 2081	- 32.2	7 42 44.41	
26	331	243 49 46.3	49 6.8	151.83	0.13	9.994 1319	31.3	7 38 48.50	
27	332	244 50 30.9	49 51.3	151.89	- 0.05	9.994 0580	30.4	7 34 52.59	
28	333	245 51 17.0	50 37.2	151.95	+ 0.04	9.993 9862	- 29.5	7 30 56.68	
29	334	246 52 4.7	51 24.7	152.02	0.16	9.993 9164	28.6	7 27 0.77	
30	335	247 52 53.8	52 13.7	152.08	0.30	9.993 8486	27.8	7 23 4.86	
31	336	248 53 44.4	53 4.1	152.14	+ 0.42	9.993 7827	- 27.1	7 19 8.95	

NOTE.—The longitudes in the column  $\lambda$  are referred to the true equinox of their own date, while those in the column  $\lambda'$  are referred to the mean equinox of the beginning of the Besselian fictitious year.

Diff. for 1 Hour,  
— 9<sup>h</sup> 8296.  
(Table II.)

## GREENWICH MEAN TIME.

## THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	
	"	"	"	"	"	"	h m	m	d
1	16 5.1	16 9.7	58 56.0	+ 1.46	59 13.1	+ 1.38	19 8.8	2.25	23.3
2	16 14.2	16 18.2	59 29.4	1.30	59 44.2	1.16	20 2.6	2.24	24.3
3	16 21.8	16 24.7	59 57.3	1.00	60 8.2	0.79	20 56.3	2.24	25.3
4	16 27.0	16 28.3	60 16.4	+ 0.55	60 21.5	+ 0.29	21 50.3	2.26	26.3
5	16 28.8	16 28.3	60 23.3	0.00	60 21.5	- 0.30	22 44.8	2.29	27.3
6	16 26.9	16 24.4	60 16.1	- 0.61	60 6.9	0.91	23 40.1	2.32	28.3
7	16 20.9	16 16.6	59 54.2	- 1.18	59 38.2	- 1.45	6		29.3
8	16 11.4	16 5.6	59 19.2	1.69	58 57.8	1.86	0 36.1	2.34	0.8
9	15 59.2	15 52.5	58 34.5	2.00	58 9.8	2.09	1 32.2	2.32	1.8
10	15 45.6	15 38.6	57 44.3	- 2.13	57 18.6	- 2.13	2 27.5	2.28	2.8
11	15 31.7	15 25.0	56 53.2	2.08	56 28.6	2.01	3 21.3	2.20	3.8
12	15 18.6	15 12.6	56 5.2	1.89	55 43.4	1.74	4 12.9	2.10	4.8
13	15 7.2	15 2.4	55 23.4	- 1.57	55 5.7	- 1.38	5 1.9	1.99	5.8
14	14 58.1	14 54.6	54 50.2	1.18	54 37.3	0.97	5 48.5	1.90	6.8
15	14 51.8	14 49.7	54 26.9	0.75	54 19.1	0.54	6 33.2	1.83	7.8
16	14 48.3	14 47.5	54 14.0	- 0.33	54 11.3	- 0.12	7 16.4	1.78	8.8
17	14 47.5	14 48.1	54 11.1	+ 0.08	54 13.3	+ 0.28	7 58.8	1.76	9.8
18	14 49.3	14 51.1	54 17.7	0.45	54 24.2	0.61	8 41.2	1.78	10.8
19	14 53.3	14 56.1	54 32.5	+ 0.77	54 42.6	+ 0.90	9 24.3	1.82	11.8
20	14 59.2	15 2.7	54 54.1	1.01	55 6.8	1.10	10 8.7	1.89	12.8
21	15 6.4	15 10.3	55 20.5	1.17	55 35.0	1.23	10 55.0	1.98	13.8
22	15 14.4	15 18.6	55 49.9	+ 1.26	56 5.2	+ 1.28	11 43.6	2.07	14.8
23	15 22.7	15 27.0	56 20.6	1.28	56 36.0	1.27	12 34.5	2.17	15.8
24	15 31.1	15 35.1	56 51.1	1.24	57 5.9	1.21	13 27.5	2.24	16.8
25	15 39.0	15 42.7	57 20.1	+ 1.17	57 33.9	+ 1.12	14 21.9	2.28	17.8
26	15 46.3	15 49.7	57 47.1	1.07	57 59.7	1.02	15 16.8	2.28	18.8
27	15 53.0	15 56.1	58 11.7	0.97	58 23.0	0.92	16 11.4	2.26	19.8
28	15 59.0	16 1.7	58 33.7	+ 0.86	58 43.8	+ 0.80	17 5.2	2.22	20.8
29	16 4.3	16 6.6	58 53.1	0.75	59 1.7	0.68	17 58.1	2.19	21.8
30	16 8.7	16 10.5	59 9.4	0.60	59 16.1	0.51	18 50.2	2.17	22.8
31	16 12.1	16 13.2	59 21.7	0.40	59 25.9	+ 0.29	19 42.1	2.17	23.8
32	16 14.0	16 14.2	59 28.6	+ 0.15	59 29.5	0.00	20 34.4	2.20	24.8

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 1.					THURSDAY 3.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	9 8 36.84	2.3418	N. 13 36 32.6	7.638	0	11 0 25.17	2.3204	N. 6 2 48.8	10.910
1	9 10 57.33	2.3413	13 28 51.7	7.726	1	11 2 44.39	2.3203	5 51 52.9	10.953
2	9 13 17.79	2.3407	13 21 5.5	7.813	2	11 5 3.60	2.3202	5 40 54.4	10.996
3	9 15 38.21	2.3401	13 13 14.1	7.900	3	11 7 22.81	2.3201	5 29 53.4	11.037
4	9 17 58.60	2.3396	13 5 17.5	7.986	4	11 9 42.01	2.3200	5 18 50.0	11.077
5	9 20 18.96	2.3390	12 57 15.8	8.071	5	11 12 1.21	2.3200	5 7 44.2	11.115
6	9 22 39.28	2.3384	12 49 9.0	8.156	6	11 14 20.41	2.3201	4 56 36.2	11.152
7	9 24 59.57	2.3379	12 40 57.1	8.240	7	11 16 39.62	2.3202	4 45 25.9	11.189
8	9 27 19.83	2.3373	12 32 40.2	8.323	8	11 18 58.83	2.3202	4 34 13.5	11.224
9	9 29 40.05	2.3368	12 24 18.3	8.406	9	11 21 18.04	2.3203	4 22 59.0	11.257
10	9 32 0.24	2.3362	12 15 51.5	8.487	10	11 23 37.26	2.3203	4 11 42.6	11.290
11	9 34 20.39	2.3355	12 7 19.8	8.568	11	11 25 56.48	2.3204	4 0 24.2	11.322
12	9 36 40.50	2.3349	11 58 43.3	8.648	12	11 28 15.71	2.3206	3 49 4.0	11.358
13	9 39 0.58	2.3344	11 50 2.0	8.727	13	11 30 34.95	2.3208	3 37 42.0	11.381
14	9 41 20.63	2.3338	11 41 16.0	8.806	14	11 32 54.21	2.3211	3 26 18.3	11.408
15	9 43 40.64	2.3333	11 32 25.3	8.883	15	11 35 13.48	2.3213	3 14 53.0	11.434
16	9 46 0.62	2.3328	11 23 30.0	8.960	16	11 37 32.76	2.3215	3 3 26.2	11.459
17	9 48 20.57	2.3322	11 14 30.1	9.036	17	11 39 52.06	2.3218	2 51 57.9	11.483
18	9 50 40.48	2.3316	11 5 25.7	9.111	18	11 42 11.37	2.3221	2 40 28.2	11.506
19	9 53 0.36	2.3310	10 56 16.8	9.185	19	11 44 30.71	2.3225	2 28 57.2	11.527
20	9 55 20.20	2.3304	10 47 3.5	9.258	20	11 46 50.07	2.3228	2 17 24.9	11.547
21	9 57 40.01	2.3299	10 37 45.8	9.331	21	11 49 9.45	2.3232	2 5 51.5	11.566
22	9 59 59.79	2.3294	10 28 23.8	9.404	22	11 51 28.85	2.3236	1 54 17.0	11.583
23	10 2 19.54	2.3289	N. 10 18 57.6	9.473	23	11 53 48.28	2.3240	N. 1 42 41.5	11.599
WEDNESDAY 2.					FRIDAY 4.				
0	10 4 39.26	2.3284	N. 10 9 27.1	9.543	0	11 56 7.73	2.3244	N. 1 31 5.1	11.614
1	10 6 58.95	2.3278	9 59 52.5	9.611	1	11 58 27.21	2.3249	1 19 27.8	11.627
2	10 9 18.60	2.3273	9 50 13.8	9.678	2	12 0 46.72	2.3255	1 7 49.8	11.639
3	10 11 38.23	2.3269	9 40 31.1	9.745	3	12 3 6.27	2.3261	0 56 11.1	11.651
4	10 13 57.83	2.3264	9 30 44.4	9.811	4	12 5 25.85	2.3266	0 44 31.7	11.661
5	10 16 17.40	2.3259	9 20 53.8	9.876	5	12 7 45.46	2.3272	0 32 51.8	11.668
6	10 18 36.94	2.3255	9 10 59.3	9.940	6	12 10 5.11	2.3277	0 21 11.6	11.674
7	10 20 56.46	2.3251	9 1 1.0	10.003	7	12 12 24.79	2.3283	N. 0 9 30.9	11.681
8	10 23 15.95	2.3247	8 50 59.0	10.064	8	12 14 44.51	2.3291	S. 0 2 10.1	11.685
9	10 25 35.42	2.3243	8 40 53.3	10.125	9	12 17 4.28	2.3298	0 13 51.3	11.688
10	10 27 54.86	2.3238	8 30 44.0	10.185	10	12 19 24.09	2.3305	0 25 32.6	11.689
11	10 30 14.28	2.3235	8 20 31.1	10.244	11	12 21 43.94	2.3312	0 37 14.0	11.689
12	10 32 33.68	2.3232	8 10 14.7	10.302	12	12 24 3.83	2.3319	0 48 55.3	11.688
13	10 34 53.06	2.3228	7 59 54.9	10.358	13	12 26 23.77	2.3327	1 0 36.5	11.685
14	10 37 12.42	2.3225	7 49 31.7	10.414	14	12 28 43.76	2.3335	1 12 17.5	11.681
15	10 39 31.76	2.3222	7 39 5.2	10.469	15	12 31 3.79	2.3343	1 23 58.2	11.675
16	10 41 51.08	2.3219	7 28 35.4	10.523	16	12 33 23.87	2.3352	1 35 38.5	11.668
17	10 44 10.39	2.3217	7 18 2.5	10.574	17	12 35 44.01	2.3361	1 47 18.4	11.660
18	10 46 29.68	2.3214	7 7 26.5	10.626	18	12 38 4.20	2.3369	1 58 57.7	11.650
19	10 48 48.96	2.3212	6 56 47.4	10.676	19	12 40 24.44	2.3378	2 10 36.4	11.639
20	10 51 8.22	2.3209	6 46 5.4	10.725	20	12 42 44.74	2.3388	2 22 14.4	11.627
21	10 53 27.47	2.3207	6 35 20.4	10.773	21	12 45 5.09	2.3397	2 33 51.6	11.613
22	10 55 46.71	2.3206	6 24 32.6	10.819	22	12 47 25.50	2.3406	2 45 28.0	11.598
23	10 58 5.94	2.3205	6 13 42.1	10.865	23	12 49 45.96	2.3416	2 57 3.4	11.582
24	11 0 25.17	2.3204	N. 6 2 48.8	10.910	24	12 52 6.49	2.3427	S. 3 8 37.8	11.564

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 5.					MONDAY 7.				
0	12 52 6.49	2.3427	S. 3 8 37.8	11.564	0	14 45 54.26	2.3992	S. 11 37 18.9	9.135
1	12 54 27.08	2.3437	3 20 11.1	11.544	1	14 48 18.24	2.4002	11 46 24.6	9.055
2	12 56 47.73	2.3447	3 31 43.1	11.523	2	14 50 42.28	2.4012	11 55 25.5	8.973
3	12 59 8.44	2.3457	3 43 13.9	11.502	3	14 53 6.38	2.4021	12 4 21.4	8.891
4	13 1 29.21	2.3468	3 54 43.3	11.478	4	14 55 30.53	2.4030	12 13 12.4	8.808
5	13 3 50.05	2.3479	4 6 11.2	11.453	5	14 57 54.74	2.4040	12 21 58.3	8.723
6	13 6 10.96	2.3490	4 17 37.7	11.427	6	15 0 19.01	2.4048	12 30 39.1	8.637
7	13 8 31.93	2.3501	4 29 2.5	11.399	7	15 2 43.32	2.4057	12 39 14.7	8.550
8	13 10 52.97	2.3512	4 40 25.6	11.370	8	15 5 7.69	2.4066	12 47 45.1	8.463
9	13 13 14.07	2.3523	4 51 46.9	11.340	9	15 7 32.11	2.4074	12 56 10.2	8.374
10	13 15 35.25	2.3536	5 3 6.4	11.309	10	15 9 56.58	2.4082	13 4 30.0	8.285
11	13 17 56.50	2.3547	5 14 24.0	11.276	11	15 12 21.09	2.4088	13 12 44.4	8.194
12	13 20 17.81	2.3558	5 25 39.5	11.241	12	15 14 45.64	2.4096	13 20 53.3	8.102
13	13 22 39.20	2.3571	5 36 52.9	11.205	13	15 17 10.24	2.4103	13 28 56.7	8.010
14	13 25 0.66	2.3583	5 48 4.1	11.168	14	15 19 34.87	2.4108	13 36 54.5	7.918
15	13 27 22.19	2.3594	5 59 13.1	11.130	15	15 21 59.54	2.4115	13 44 46.8	7.825
16	13 29 43.79	2.3607	6 10 19.7	11.089	16	15 24 24.25	2.4121	13 52 33.5	7.730
17	13 32 5.47	2.3619	6 21 23.8	11.048	17	15 26 48.99	2.4126	14 0 14.4	7.634
18	13 34 27.22	2.3631	6 32 25.4	11.006	18	15 29 13.76	2.4131	14 7 49.6	7.538
19	13 36 49.04	2.3643	6 43 24.5	10.962	19	15 31 38.56	2.4136	14 15 19.0	7.441
20	13 39 10.94	2.3656	6 54 20.9	10.917	20	15 34 3.39	2.4140	14 22 42.5	7.343
21	13 41 32.91	2.3668	7 5 14.5	10.870	21	15 36 28.24	2.4143	14 30 0.1	7.244
22	13 43 54.96	2.3682	7 16 5.3	10.822	22	15 38 53.11	2.4147	14 37 11.8	7.146
23	13 46 17.09	2.3694	S. 7 26 53.1	10.773	23	15 41 18.00	2.4149	S. 14 44 17.6	7.046
SUNDAY 6.					TUESDAY 8.				
0	13 48 39.29	2.3707	S. 7 37 38.0	10.723	0	15 43 42.90	2.4152	S. 14 51 17.3	6.944
1	13 51 1.57	2.3719	7 48 19.8	10.671	1	15 46 7.82	2.4154	14 58 10.9	6.843
2	13 53 23.92	2.3732	7 58 58.5	10.618	2	15 48 32.75	2.4155	15 4 58.5	6.742
3	13 55 46.35	2.3744	8 9 33.9	10.563	3	15 50 57.68	2.4156	15 11 39.9	6.638
4	13 58 8.85	2.3757	8 20 6.0	10.507	4	15 53 22.62	2.4157	15 18 15.1	6.535
5	14 0 31.43	2.3770	8 30 34.7	10.450	5	15 55 47.56	2.4157	15 24 44.1	6.432
6	14 2 54.09	2.3783	8 41 0.0	10.392	6	15 58 12.50	2.4157	15 31 6.9	6.328
7	14 5 16.82	2.3795	8 51 21.7	10.332	7	16 0 37.44	2.4156	15 37 23.4	6.222
8	14 7 39.63	2.3808	9 1 39.8	10.271	8	16 3 2.37	2.4154	15 43 33.5	6.116
9	14 10 2.51	2.3819	9 11 54.2	10.209	9	16 5 27.29	2.4153	15 49 37.3	6.011
10	14 12 25.46	2.3832	9 22 4.9	10.147	10	16 7 52.20	2.4151	15 55 34.8	5.905
11	14 14 48.49	2.3844	9 32 11.8	10.082	11	16 10 17.10	2.4147	16 1 25.9	5.798
12	14 17 11.59	2.3856	9 42 14.7	10.015	12	16 12 41.97	2.4143	16 7 10.5	5.690
13	14 19 34.76	2.3868	9 52 13.6	9.948	13	16 15 6.82	2.4140	16 12 48.7	5.583
14	14 21 58.01	2.3881	10 2 8.5	9.880	14	16 17 31.65	2.4137	16 18 20.4	5.474
15	14 24 21.33	2.3892	10 11 59.2	9.811	15	16 19 56.46	2.4132	16 23 45.6	5.365
16	14 26 44.72	2.3904	10 21 45.8	9.741	16	16 22 21.23	2.4126	16 29 4.2	5.256
17	14 29 8.18	2.3916	10 31 28.1	9.668	17	16 24 45.97	2.4120	16 34 16.3	5.147
18	14 31 31.71	2.3927	10 41 6.0	9.595	18	16 27 10.67	2.4113	16 39 21.8	5.037
19	14 33 55.30	2.3938	10 50 39.5	9.522	19	16 29 35.33	2.4106	16 44 20.7	4.927
20	14 36 18.96	2.3949	11 0 8.6	9.447	20	16 31 59.94	2.4098	16 49 13.0	4.817
21	14 38 42.69	2.3961	11 9 33.1	9.371	21	16 34 24.51	2.4091	16 53 58.7	4.707
22	14 41 6.49	2.3971	11 18 53.1	9.294	22	16 36 49.03	2.4082	16 58 37.8	4.595
23	14 43 30.34	2.3981	11 28 8.4	9.215	23	16 39 13.49	2.4073	17 3 10.1	4.482
24	14 45 54.26	2.3992	S. 11 37 18.9	9.135	24	16 41 37.90	2.4063	S. 17 7 35.8	4.373

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 9.					FRIDAY 11.				
0	16 41 37.90	2.4063	S. 17 7 35.8	4.372	0	18 34 57.27	2.2960	S. 18 29 6.9	0.898
1	16 44 2.25	2.4053	17 11 54.8	4.261	1	18 37 14.93	2.2926	18 28 9.9	1.001
2	16 46 26.53	2.4041	17 16 7.1	4.148	2	18 39 32.38	2.2891	18 27 6.8	1.102
3	16 48 50.74	2.4029	17 20 12.6	4.037	3	18 41 49.62	2.2857	18 25 57.7	1.203
4	16 51 14.88	2.4018	17 24 11.5	3.925	4	18 44 6.66	2.2822	18 24 42.5	1.303
5	16 53 38.95	2.4005	17 28 3.6	3.813	5	18 46 23.48	2.2786	18 23 21.3	1.403
6	16 56 2.94	2.3992	17 31 49.0	3.700	6	18 48 40.09	2.2750	18 21 54.1	1.503
7	16 58 26.85	2.3978	17 35 27.6	3.588	7	18 50 56.48	2.2713	18 20 21.0	1.602
8	17 0 50.68	2.3964	17 38 59.5	3.475	8	18 53 12.65	2.2678	18 18 41.9	1.700
9	17 3 14.42	2.3949	17 42 24.6	3.363	9	18 55 28.61	2.2642	18 16 57.0	1.798
10	17 5 38.07	2.3933	17 45 43.0	3.250	10	18 57 44.35	2.2605	18 15 6.2	1.895
11	17 8 1.62	2.3917	17 48 54.6	3.137	11	18 59 59.87	2.2568	18 13 9.6	1.991
12	17 10 25.07	2.3901	17 51 59.4	3.024	12	19 2 15.16	2.2530	18 11 7.3	2.087
13	17 12 48.43	2.3884	17 54 57.5	2.912	13	19 4 30.23	2.2493	18 8 59.2	2.182
14	17 15 11.68	2.3866	17 57 48.8	2.799	14	19 6 45.07	2.2454	18 6 45.4	2.277
15	17 17 34.82	2.3847	18 0 33.4	2.687	15	19 8 59.68	2.2417	18 4 26.0	2.371
16	17 19 57.85	2.3828	18 3 11.2	2.573	16	19 11 14.07	2.2379	18 2 0.9	2.465
17	17 22 20.76	2.3809	18 5 42.2	2.461	17	19 13 28.23	2.2341	17 59 30.2	2.558
18	17 24 43.56	2.3790	18 8 6.5	2.349	18	19 15 42.16	2.2302	17 56 53.9	2.650
19	17 27 6.24	2.3769	18 10 24.1	2.237	19	19 17 55.85	2.2263	17 54 12.2	2.741
20	17 29 28.79	2.3748	18 12 35.0	2.125	20	19 20 9.31	2.2224	17 51 25.0	2.832
21	17 31 51.21	2.3726	18 14 39.1	2.013	21	19 22 22.54	2.2185	17 48 32.4	2.923
22	17 34 13.50	2.3704	18 16 36.6	1.902	22	19 24 35.53	2.2146	17 45 34.3	3.013
23	17 36 35.66	2.3682	S. 18 18 27.3	1.790	23	19 26 48.29	2.2107	S. 17 42 30.9	3.102
THURSDAY 10.					SATURDAY 12.				
0	17 38 57.68	2.3658	S. 18 20 11.4	1.679	0	19 29 0.81	2.2068	S. 17 39 22.1	3.190
1	17 41 19.56	2.3634	18 21 48.8	1.568	1	19 31 13.10	2.2028	17 36 8.1	3.278
2	17 43 41.29	2.3610	18 23 19.5	1.457	2	19 33 25.15	2.1988	17 32 48.8	3.365
3	17 46 2.88	2.3586	18 24 43.6	1.346	3	19 35 36.96	2.1949	17 29 24.3	3.452
4	17 48 24.32	2.3561	18 26 1.0	1.235	4	19 37 48.54	2.1910	17 25 54.6	3.538
5	17 50 45.61	2.3535	18 27 11.8	1.125	5	19 39 59.88	2.1870	17 22 19.8	3.623
6	17 53 6.74	2.3508	18 28 16.0	1.015	6	19 42 10.98	2.1830	17 18 39.9	3.708
7	17 55 27.71	2.3482	18 29 13.6	0.906	7	19 44 21.84	2.1790	17 14 54.9	3.791
8	17 57 48.52	2.3454	18 30 4.7	0.797	8	19 46 32.46	2.1750	17 11 5.0	3.873
9	18 0 9.16	2.3427	18 30 49.2	0.688	9	19 48 42.84	2.1710	17 7 10.1	3.957
10	18 2 29.64	2.3399	18 31 27.2	0.579	10	19 50 52.98	2.1671	17 3 10.2	4.038
11	18 4 49.95	2.3370	18 31 58.7	0.471	11	19 53 2.89	2.1632	16 59 5.5	4.119
12	18 7 10.08	2.3341	18 32 23.7	0.363	12	19 55 12.56	2.1592	16 54 55.9	4.200
13	18 9 30.04	2.3312	18 32 42.2	0.255	13	19 57 21.99	2.1551	16 50 41.5	4.280
14	18 11 49.82	2.3282	18 32 54.3	0.148	14	19 59 31.17	2.1511	16 46 22.3	4.358
15	18 14 9.42	2.3252	18 33 0.0	0.042	15	20 1 40.12	2.1472	16 41 58.5	4.437
16	18 16 28.84	2.3221	18 32 59.3	+ 0.064	16	20 3 48.83	2.1432	16 37 29.9	4.515
17	18 18 48.07	2.3189	18 32 52.3	0.170	17	20 5 57.30	2.1393	16 32 56.7	4.592
18	18 21 7.11	2.3158	18 32 38.9	0.276	18	20 8 5.54	2.1353	16 28 18.9	4.668
19	18 23 25.96	2.3126	18 32 19.2	0.381	19	20 10 13.53	2.1313	16 23 36.5	4.744
20	18 25 44.62	2.3093	18 31 53.2	0.486	20	20 12 21.29	2.1273	16 18 49.6	4.819
21	18 28 3.08	2.3060	18 31 20.9	0.590	21	20 14 28.81	2.1234	16 13 58.2	4.893
22	18 30 21.34	2.3028	18 30 42.4	0.693	22	20 16 36.10	2.1195	16 9 2.4	4.967
23	18 32 39.41	2.2994	18 29 57.7	0.796	23	20 18 43.15	2.1156	16 4 2.2	5.040
24	18 34 57.27	2.2960	S. 18 29 6.9	0.898	24	20 20 49.97	2.1117	S. 15 58 57.6	5.113

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 13.					TUESDAY 15.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	20 20 49.97	2.1117	S. 15 58 57.6	5.113	0	21 58 5.32	1.9516	S. 10 42 35.1	7.829
1	20 22 56.55	2.1078	15 53 48.7	5.184	1	22 0 2.34	1.9491	10 34 44.1	7.871
2	20 25 2.90	2.1038	15 48 35.5	5.255	2	22 1 59.21	1.9166	10 26 50.6	7.912
3	20 27 9.01	2.0999	15 43 18.1	5.325	3	22 3 55.93	1.9441	10 18 54.7	7.953
4	20 29 14.90	2.0962	15 37 56.5	5.394	4	22 5 52.50	1.9417	10 10 56.3	7.993
5	20 31 20.55	2.0923	15 32 30.8	5.463	5	22 7 48.93	1.9393	10 2 55.5	8.033
6	20 33 25.98	2.0885	15 27 0.9	5.533	6	22 9 45.22	1.9370	9 54 52.4	8.072
7	20 35 31.17	2.0847	15 21 26.9	5.601	7	22 11 41.37	1.9347	9 46 46.9	8.110
8	20 37 36.14	2.0809	15 15 48.8	5.667	8	22 13 37.38	1.9324	9 38 39.2	8.148
9	20 39 40.88	2.0772	15 10 6.8	5.733	9	22 15 33.26	1.9302	9 30 29.2	8.185
10	20 41 45.40	2.0734	15 4 20.8	5.799	10	22 17 29.01	1.9281	9 22 17.0	8.222
11	20 43 49.69	2.0697	14 58 30.9	5.864	11	22 19 24.63	1.9260	9 14 2.6	8.259
12	20 45 53.76	2.0660	14 52 37.1	5.928	12	22 21 20.13	1.9239	9 5 45.9	8.295
13	20 47 57.61	2.0623	14 46 39.5	5.992	13	22 23 15.50	1.9218	8 57 27.2	8.329
14	20 50 1.24	2.0587	14 40 38.0	6.056	14	22 25 10.75	1.9198	8 49 6.4	8.363
15	20 52 4.65	2.0550	14 34 32.8	6.118	15	22 27 5.88	1.9178	8 40 43.6	8.397
16	20 54 7.84	2.0513	14 28 23.8	6.181	16	22 29 0.89	1.9159	8 32 18.7	8.431
17	20 56 10.81	2.0478	14 22 11.1	6.242	17	22 30 55.79	1.9141	8 23 51.9	8.463
18	20 58 13.57	2.0443	14 15 54.8	6.302	18	22 32 50.58	1.9123	8 15 23.1	8.497
19	21 0 16.12	2.0408	14 9 34.9	6.362	19	22 34 45.27	1.9106	8 6 52.3	8.529
20	21 2 18.46	2.0373	14 3 11.4	6.422	20	22 36 39.85	1.9088	7 58 19.6	8.560
21	21 4 20.59	2.0337	13 56 44.3	6.480	21	22 38 34.32	1.9070	7 49 45.1	8.591
22	21 6 22.50	2.0302	13 50 13.8	6.538	22	22 40 28.69	1.9054	7 41 8.7	8.622
23	21 8 24.21	2.0268	S. 13 43 39.8	6.595	23	22 42 22.97	1.9038	S. 7 32 30.5	8.651
MONDAY 14.					WEDNESDAY 16.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	21 10 25.72	2.0234	S. 13 37 2.4	6.652	0	22 44 17.15	1.9023	S. 7 23 50.6	8.680
1	21 12 27.02	2.0201	13 30 21.6	6.708	1	22 46 11.24	1.9008	7 15 8.9	8.709
2	21 14 28.13	2.0167	13 23 37.5	6.763	2	22 48 5.24	1.8993	7 6 25.5	8.737
3	21 16 29.03	2.0133	13 16 50.0	6.818	3	22 49 59.15	1.8978	6 57 40.4	8.765
4	21 18 29.73	2.0101	13 9 59.3	6.872	4	22 51 52.98	1.8964	6 48 53.7	8.793
5	21 20 30.24	2.0069	13 3 5.4	6.925	5	22 53 46.72	1.8951	6 40 5.3	8.819
6	21 22 30.56	2.0037	12 56 8.3	6.978	6	22 55 40.39	1.8938	6 31 15.4	8.845
7	21 24 30.68	2.0004	12 49 8.0	7.031	7	22 57 33.98	1.8925	6 22 23.9	8.871
8	21 26 30.61	1.9973	12 42 4.6	7.083	8	22 59 27.49	1.8913	6 13 30.9	8.896
9	21 28 30.35	1.9942	12 34 58.1	7.134	9	23 1 20.94	1.8902	6 4 36.4	8.921
10	21 30 29.91	1.9911	12 27 48.5	7.184	10	23 3 14.32	1.8891	5 55 40.4	8.945
11	21 32 29.28	1.9880	12 20 36.0	7.233	11	23 5 7.63	1.8880	5 46 43.0	8.968
12	21 34 28.47	1.9850	12 13 20.5	7.283	12	23 7 0.88	1.8870	5 37 44.2	8.992
13	21 36 27.48	1.9820	12 6 2.1	7.332	13	23 8 54.07	1.8860	5 28 44.0	9.014
14	21 38 26.31	1.9791	11 58 40.7	7.380	14	23 10 47.20	1.8851	5 19 42.5	9.037
15	21 40 24.97	1.9762	11 51 16.5	7.428	15	23 12 40.28	1.8843	5 10 39.7	9.058
16	21 42 23.45	1.9733	11 43 49.4	7.475	16	23 14 33.31	1.8835	5 1 35.6	9.078
17	21 44 21.76	1.9704	11 36 19.5	7.521	17	23 16 26.30	1.8827	4 52 30.3	9.099
18	21 46 19.90	1.9676	11 28 46.9	7.567	18	23 18 19.23	1.8818	4 43 23.7	9.119
19	21 48 17.87	1.9648	11 21 11.5	7.612	19	23 20 12.12	1.8812	4 34 16.0	9.138
20	21 50 15.68	1.9622	11 13 33.5	7.656	20	23 22 4.98	1.8806	4 25 7.1	9.157
21	21 52 13.33	1.9595	11 5 52.8	7.700	21	23 23 57.79	1.8799	4 15 57.1	9.176
22	21 54 10.82	1.9568	10 58 9.5	7.743	22	23 25 50.57	1.8794	4 6 46.0	9.194
23	21 56 8.15	1.9542	10 50 23.6	7.787	23	23 27 43.32	1.8789	3 57 33.8	9.212
24	21 58 5.32	1.9516	S. 10 42 35.1	7.829	24	23 29 36.04	1.8785	S. 3 48 20.6	9.228

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 17.					SATURDAY 19.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	23 29 36.04	1.8785	S. 3 48 20.6	9.228	0	1 0 7.04	1.9106	N. 3 44 2.9	9.408
1	23 31 28.74	1.8781	3 39 6.4	9.245	1	1 2 1.73	1.9123	3 53 27.1	9.398
2	23 33 21.41	1.8777	3 29 51.2	9.261	2	1 3 56.52	1.9142	4 2 50.7	9.388
3	23 35 14.06	1.8773	3 20 35.1	9.276	3	1 5 51.43	1.9160	4 12 13.7	9.378
4	23 37 6.69	1.8771	3 11 18.1	9.291	4	1 7 46.44	1.9178	4 21 36.0	9.365
5	23 38 59.31	1.8769	3 2 0.2	9.305	5	1 9 41.57	1.9198	4 30 57.5	9.352
6	23 40 51.92	1.8767	2 52 41.5	9.319	6	1 11 36.82	1.9219	4 40 18.2	9.338
7	23 42 44.51	1.8765	2 43 21.9	9.332	7	1 13 32.19	1.9238	4 49 38.1	9.324
8	23 44 37.10	1.8765	2 34 1.6	9.345	8	1 15 27.68	1.9259	4 58 57.1	9.310
9	23 46 29.69	1.8764	2 24 40.5	9.357	9	1 17 23.30	1.9280	5 8 15.3	9.295
10	23 48 22.27	1.8764	2 15 18.7	9.369	10	1 19 19.04	1.9301	5 17 32.5	9.278
11	23 50 14.86	1.8765	2 5 56.2	9.381	11	1 21 14.91	1.9323	5 26 48.7	9.262
12	23 52 7.45	1.8766	1 56 33.0	9.392	12	1 23 10.92	1.9346	5 36 3.9	9.244
13	23 54 0.05	1.8768	1 47 9.2	9.401	13	1 25 7.06	1.9368	5 45 18.0	9.227
14	23 55 52.66	1.8769	1 37 44.9	9.410	14	1 27 3.33	1.9391	5 54 31.1	9.208
15	23 57 45.28	1.8771	1 28 20.0	9.420	15	1 28 59.75	1.9414	6 3 43.0	9.188
16	23 59 37.91	1.8774	1 18 54.5	9.429	16	1 30 56.30	1.9438	6 12 53.7	9.168
17	0 1 30.57	1.8778	1 9 28.5	9.437	17	1 32 53.00	1.9463	6 22 3.2	9.148
18	0 3 23.24	1.8781	1 0 2.1	9.443	18	1 34 49.85	1.9487	6 31 11.5	9.127
19	0 5 15.94	1.8786	0 50 35.3	9.451	19	1 36 46.84	1.9512	6 40 18.5	9.105
20	0 7 8.67	1.8791	0 41 8.0	9.457	20	1 38 43.99	1.9538	6 49 24.1	9.082
21	0 9 1.43	1.8796	0 31 40.4	9.463	21	1 40 41.29	1.9563	6 58 28.3	9.058
22	0 10 54.22	1.8801	0 22 12.4	9.468	22	1 42 38.74	1.9588	7 7 31.1	9.035
23	0 12 47.04	1.8807	S. 0 12 44.2	9.473	23	1 44 36.35	1.9615	N. 7 16 32.5	9.011
FRIDAY 18.					SUNDAY 20.				
0	0 14 39.90	1.8813	S. 0 3 15.7	9.478	0	1 46 34.12	1.9642	N. 7 25 32.4	8.985
1	0 16 32.80	1.8821	N. 0 6 13.1	9.482	1	1 48 32.05	1.9668	7 34 30.7	8.959
2	0 18 25.75	1.8828	0 15 42.1	9.484	2	1 50 30.14	1.9696	7 43 27.5	8.932
3	0 20 18.74	1.8836	0 25 11.2	9.487	3	1 52 28.40	1.9724	7 52 22.6	8.905
4	0 22 11.78	1.8844	0 34 40.5	9.489	4	1 54 26.83	1.9752	8 1 16.1	8.877
5	0 24 4.87	1.8853	0 44 9.9	9.491	5	1 56 25.42	1.9780	8 10 7.8	8.848
6	0 25 58.02	1.8863	0 53 39.4	9.492	6	1 58 24.19	1.9809	8 18 57.7	8.818
7	0 27 51.22	1.8873	1 3 8.9	9.492	7	2 0 23.13	1.9838	8 27 45.9	8.787
8	0 29 44.49	1.8883	1 12 38.4	9.492	8	2 2 22.25	1.9868	8 36 32.2	8.756
9	0 31 37.82	1.8893	1 22 7.9	9.491	9	2 4 21.54	1.9897	8 45 16.6	8.724
10	0 33 31.21	1.8904	1 31 37.3	9.489	10	2 6 21.01	1.9927	8 53 59.1	8.692
11	0 35 24.67	1.8916	1 41 6.6	9.487	11	2 8 20.66	1.9958	9 2 39.6	8.658
12	0 37 18.20	1.8928	1 50 35.8	9.485	12	2 10 20.50	1.9988	9 11 18.1	8.624
13	0 39 11.80	1.8940	2 0 4.8	9.482	13	2 12 20.52	2.0019	9 19 54.5	8.589
14	0 41 5.48	1.8953	2 9 33.6	9.478	14	2 14 20.73	2.0050	9 28 28.8	8.554
15	0 42 59.24	1.8967	2 19 2.2	9.474	15	2 16 21.12	2.0082	9 37 1.0	8.518
16	0 44 53.08	1.8981	2 28 30.5	9.469	16	2 18 21.71	2.0114	9 45 30.9	8.480
17	0 46 47.01	1.8995	2 37 58.5	9.464	17	2 20 22.49	2.0146	9 53 58.6	8.443
18	0 48 41.02	1.9009	2 47 26.2	9.458	18	2 22 23.46	2.0178	10 2 24.0	8.403
19	0 50 35.12	1.9024	2 56 53.5	9.451	19	2 24 24.63	2.0211	10 10 47.0	8.364
20	0 52 29.31	1.9040	3 6 20.3	9.443	20	2 26 25.99	2.0244	10 19 7.7	8.324
21	0 54 23.60	1.9056	3 15 46.7	9.437	21	2 28 27.56	2.0277	10 27 25.9	8.283
22	0 56 17.98	1.9072	3 25 12.7	9.428	22	2 30 29.32	2.0310	10 35 41.7	8.242
23	0 58 12.46	1.9088	3 34 38.1	9.418	23	2 32 31.28	2.0344	10 43 54.9	8.198
24	1 0 7.04	1.9106	N. 3 44 2.9	9.408	24	2 34 33.45	2.0378	N. 10 52 5.5	8.155



## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 21.					WEDNESDAY 23.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	2 34 33.45	2.0378	N. 10 52 5.5	8.155	0	4 16 33.24	2.2136	N. 16 18 24.1	5.131
1	2 36 35.82	2.0413	11 0 13.5	8.112	1	4 18 46.16	2.2171	16 23 29.5	5.048
2	2 38 38.40	2.0448	11 8 18.9	8.067	2	4 20 59.29	2.2207	16 28 29.9	4.964
3	2 40 41.19	2.0482	11 16 21.5	8.021	3	4 23 12.64	2.2243	16 33 25.2	4.880
4	2 42 44.18	2.0517	11 24 21.4	7.974	4	4 25 26.20	2.2278	16 38 15.5	4.796
5	2 44 47.39	2.0552	11 32 18.4	7.927	5	4 27 39.97	2.2312	16 43 0.7	4.711
6	2 46 50.80	2.0587	11 40 12.6	7.879	6	4 29 53.94	2.2346	16 47 40.8	4.625
7	2 48 54.43	2.0623	11 48 3.9	7.831	7	4 32 8.12	2.2381	16 52 15.7	4.538
8	2 50 58.27	2.0658	11 55 52.3	7.781	8	4 34 22.51	2.2415	16 56 45.3	4.449
9	2 53 2.32	2.0693	12 3 37.6	7.729	9	4 36 37.10	2.2448	17 1 9.6	4.361
10	2 55 6.59	2.0729	12 11 19.8	7.678	10	4 38 51.89	2.2482	17 5 28.6	4.272
11	2 57 11.07	2.0765	12 18 59.0	7.627	11	4 41 6.89	2.2516	17 9 42.3	4.183
12	2 59 15.77	2.0802	12 26 35.0	7.573	12	4 43 22.08	2.2548	17 13 50.6	4.093
13	3 1 20.69	2.0838	12 34 7.8	7.520	13	4 45 37.47	2.2581	17 17 53.4	4.002
14	3 3 25.82	2.0874	12 41 37.4	7.466	14	4 47 53.05	2.2613	17 21 50.8	3.910
15	3 5 31.18	2.0911	12 49 3.7	7.411	15	4 50 8.83	2.2646	17 25 42.6	3.817
16	3 7 36.75	2.0948	12 56 26.7	7.355	16	4 52 24.80	2.2678	17 29 28.8	3.724
17	3 9 42.55	2.0985	13 3 46.3	7.298	17	4 54 40.96	2.2709	17 33 9.5	3.631
18	3 11 48.57	2.1022	13 11 2.4	7.239	18	4 56 57.31	2.2740	17 36 44.5	3.537
19	3 13 54.81	2.1058	13 18 15.0	7.181	19	4 59 13.84	2.2770	17 40 13.9	3.442
20	3 16 1.27	2.1095	13 25 24.1	7.122	20	5 1 30.55	2.2800	17 43 37.5	3.346
21	3 18 7.95	2.1133	13 32 29.6	7.062	21	5 3 47.44	2.2830	17 46 55.4	3.250
22	3 20 14.86	2.1170	13 39 31.5	7.001	22	5 6 4.51	2.2859	17 50 7.5	3.153
23	3 22 21.99	2.1208	N. 13 46 29.7	6.938	23	5 8 21.75	2.2888	N. 17 53 13.7	3.055
TUESDAY 22.					THURSDAY 24.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	3 24 29.35	2.1245	N. 13 53 24.1	6.876	0	5 10 39.17	2.2917	N. 17 56 14.1	2.957
1	3 26 36.93	2.1283	14 0 14.8	6.812	1	5 12 56.76	2.2946	17 59 8.6	2.858
2	3 28 44.74	2.1321	14 7 1.6	6.748	2	5 15 14.52	2.2973	18 1 57.1	2.759
3	3 30 52.78	2.1358	14 13 44.5	6.683	3	5 17 32.44	2.3001	18 4 39.7	2.660
4	3 33 1.04	2.1395	14 20 23.5	6.617	4	5 19 50.53	2.3028	18 7 16.3	2.560
5	3 35 9.52	2.1433	14 26 58.6	6.551	5	5 22 8.78	2.3054	18 9 46.9	2.459
6	3 37 18.23	2.1471	14 33 29.6	6.483	6	5 24 27.18	2.3080	18 12 11.4	2.358
7	3 39 27.17	2.1508	14 39 56.5	6.414	7	5 26 45.74	2.3106	18 14 29.8	2.256
8	3 41 36.33	2.1546	14 46 19.3	6.346	8	5 29 4.45	2.3131	18 16 42.1	2.154
9	3 43 45.72	2.1583	14 52 38.0	6.276	9	5 31 23.31	2.3155	18 18 48.3	2.052
10	3 45 55.33	2.1620	14 58 52.4	6.204	10	5 33 42.31	2.3179	18 20 48.3	1.948
11	3 48 5.16	2.1658	15 5 2.5	6.133	11	5 36 1.46	2.3203	18 22 42.1	1.844
12	3 50 15.22	2.1695	15 11 8.3	6.061	12	5 38 20.75	2.3227	18 24 29.6	1.740
13	3 52 25.50	2.1733	15 17 9.8	5.987	13	5 40 40.18	2.3249	18 26 10.9	1.637
14	3 54 36.01	2.1770	15 23 6.8	5.913	14	5 42 59.74	2.3271	18 27 46.0	1.532
15	3 56 46.74	2.1807	15 28 59.4	5.839	15	5 45 19.43	2.3292	18 29 14.7	1.426
16	3 58 57.69	2.1843	15 34 47.5	5.763	16	5 47 39.25	2.3313	18 30 37.1	1.320
17	4 1 8.86	2.1881	15 40 31.0	5.687	17	5 49 59.19	2.3334	18 31 53.1	1.214
18	4 3 20.26	2.1918	15 46 9.9	5.610	18	5 52 19.26	2.3355	18 33 2.8	1.108
19	4 5 31.88	2.1954	15 51 44.2	5.532	19	5 54 39.45	2.3374	18 34 6.1	1.001
20	4 7 43.71	2.1991	15 57 13.8	5.453	20	5 56 59.75	2.3393	18 35 2.9	0.893
21	4 9 55.77	2.2028	16 2 38.6	5.373	21	5 59 20.16	2.3411	18 35 53.3	0.787
22	4 12 8.04	2.2063	16 7 58.6	5.293	22	6 1 40.68	2.3428	18 36 37.3	0.679
23	4 14 20.53	2.2100	16 13 13.8	5.212	23	6 4 1.30	2.3446	18 37 14.8	0.571
24	4 16 33.24	2.2136	N. 16 18 24.1	5.131	24	6 6 22.03	2.3463	N. 18 37 45.8	0.463

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 25.					SUNDAY 27.				
0	h m s	s	N. 18 37 45.8	0.463	0	h m s	s	N. 16 53 39.0	4.762
1	6 6 22.03	2.3463	18 38 10.3	0.354	1	7 59 51.20	2.3619	16 48 50.2	4.865
2	6 8 42.86	2.3479	18 38 28.3	0.246	2	8 2 12.89	2.3610	16 43 55.2	4.968
3	6 11 3.78	2.3495	18 38 39.8	0.137	3	8 4 34.52	2.3601	16 38 54.1	5.070
4	6 13 24.80	2.3510	18 38 44.7	+0.027	4	8 6 56.10	2.3592	16 33 46.8	5.172
5	6 15 45.90	2.3524	18 38 43.0	-0.083	5	8 9 17.62	2.3582	16 28 33.4	5.273
6	6 18 7.09	2.3538	18 38 34.8	0.192	6	8 11 39.08	2.3572	16 23 14.0	5.374
7	6 20 28.36	2.3552	18 38 20.0	0.302	7	8 14 0.48	2.3562	16 17 48.5	5.475
8	6 22 49.71	2.3564	18 37 58.6	0.412	8	8 16 21.82	2.3551	16 12 17.0	5.574
9	6 25 11.13	2.3577	18 37 30.6	0.522	9	8 18 43.09	2.3539	16 6 39.6	5.673
10	6 27 32.63	2.3588	18 36 56.0	0.632	10	8 21 4.29	2.3528	16 0 56.2	5.773
11	6 29 54.19	2.3599	18 36 14.8	0.742	11	8 23 25.42	2.3517	15 55 6.9	5.871
12	6 32 15.82	2.3610	18 35 27.0	0.852	12	8 25 46.49	2.3505	15 49 11.7	5.968
13	6 34 37.51	2.3620	18 34 32.6	0.963	13	8 28 7.48	2.3493	15 43 10.7	6.065
14	6 36 59.26	2.3629	18 33 31.5	1.073	14	8 30 28.40	2.3480	15 37 3.9	6.161
15	6 39 21.06	2.3638	18 32 23.8	1.184	15	8 32 49.24	2.3467	15 30 51.4	6.257
16	6 41 42.91	2.3646	18 31 9.4	1.295	16	8 35 10.00	2.3454	15 24 33.1	6.352
17	6 44 4.81	2.3654	18 29 48.4	1.405	17	8 37 30.69	2.3442	15 18 9.2	6.446
18	6 46 26.76	2.3662	18 28 20.8	1.516	18	8 39 51.30	2.3428	15 11 39.6	6.541
19	6 48 48.75	2.3668	18 26 46.5	1.627	19	8 42 11.82	2.3413	15 5 4.3	6.634
20	6 51 10.77	2.3673	18 25 5.6	1.738	20	8 44 32.26	2.3400	14 58 37.5	6.726
21	6 53 32.83	2.3679	18 23 18.0	1.848	21	8 46 52.62	2.3387	14 51 23.2	6.818
22	6 55 54.92	2.3683	18 21 23.9	1.958	22	8 49 12.90	2.3373	14 44 45.4	6.908
23	6 58 17.03	2.3688	N. 18 19 23.1	2.068	23	8 51 33.09	2.3358	N. 14 37 48.2	6.999
24	7 0 39.17	2.3692				8 53 53.19	2.3343		
SATURDAY 26.					MONDAY 28.				
0	7 3 1.33	2.3695	N. 18 17 15.7	2.179	0	8 56 13.21	2.3328	N. 14 30 45.5	7.089
1	7 5 23.51	2.3698	18 15 1.6	2.289	1	8 58 33.13	2.3313	14 23 37.5	7.178
2	7 7 45.70	2.3699	18 12 41.0	2.398	2	9 0 52.97	2.3298	14 16 24.2	7.266
3	7 10 7.90	2.3700	18 10 13.8	2.509	3	9 3 12.71	2.3283	14 9 5.6	7.353
4	7 12 30.10	2.3701	18 7 39.9	2.619	4	9 5 32.37	2.3268	14 1 41.8	7.440
5	7 14 52.31	2.3702	18 4 59.5	2.728	5	9 7 51.93	2.3253	13 54 12.8	7.527
6	7 17 14.52	2.3702	18 2 12.5	2.838	6	9 10 11.40	2.3238	13 46 38.6	7.612
7	7 19 36.73	2.3702	17 59 18.9	2.948	7	9 12 30.78	2.3223	13 38 59.4	7.695
8	7 21 58.94	2.3701	17 56 18.8	3.057	8	9 14 50.07	2.3208	13 31 15.2	7.779
9	7 24 21.14	2.3699	17 53 12.1	3.166	9	9 17 9.27	2.3192	13 23 25.9	7.862
10	7 26 43.33	2.3697	17 49 58.9	3.274	10	9 19 28.37	2.3176	13 15 31.7	7.944
11	7 29 5.50	2.3694	17 46 39.2	3.383	11	9 21 47.38	2.3160	13 7 32.6	8.026
12	7 31 27.66	2.3692	17 43 13.0	3.491	12	9 24 6.29	2.3144	12 59 28.6	8.106
13	7 33 49.80	2.3688	17 39 40.3	3.598	13	9 26 25.11	2.3129	12 51 19.9	8.185
14	7 36 11.91	2.3683	17 36 1.2	3.706	14	9 28 43.84	2.3114	12 43 6.4	8.264
15	7 38 34.00	2.3679	17 32 15.6	3.813	15	9 31 2.48	2.3098	12 34 48.2	8.342
16	7 40 56.06	2.3674	17 28 23.6	3.920	16	9 33 21.02	2.3083	12 26 25.3	8.419
17	7 43 18.09	2.3668	17 24 25.2	4.027	17	9 35 39.47	2.3068	12 17 57.9	8.495
18	7 45 40.08	2.3663	17 20 20.4	4.133	18	9 37 57.83	2.3053	12 9 25.9	8.571
19	7 48 2.04	2.3657	17 16 9.3	4.238	19	9 40 16.10	2.3037	12 0 49.4	8.646
20	7 50 23.96	2.3650	17 11 51.8	4.344	20	9 42 34.27	2.3021	11 52 8.4	8.719
21	7 52 45.84	2.3643	17 7 28.0	4.449	21	9 44 52.35	2.3006	11 43 23.1	8.792
22	7 55 7.67	2.3635	17 2 57.9	4.553	22	9 47 10.34	2.2991	11 34 33.4	8.864
23	7 57 29.46	2.3628	16 58 21.6	4.658	23	9 49 28.24	2.2975	11 25 39.4	8.935
24	7 59 51.20	2.3619	N. 16 53 39.0	4.762	24	9 51 46.04	2.2960	N. 11 16 41.2	9.005

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 29.					THURSDAY, DECEMBER 1.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	9 51 46.04	2.2960	N. 11 16 41.2	9.005	0	11 40 38.26	2.2509	N. 3 2 3.1	11.212
1	9 54 3.76	2.2946	11 7 38.8	9.074	PHASES OF THE MOON.				
2	9 56 21.39	2.2931	10 58 32.3	9.142					
3	9 58 38.93	2.2917	10 49 21.7	9.210					
4	10 0 56.39	2.2903	10 40 7.1	9.276					
5	10 3 13.76	2.2888	10 30 48.6	9.341					
6	10 5 31.04	2.2873	10 21 26.2	9.406					
7	10 7 48.24	2.2860	10 11 59.9	9.470					
8	10 10 5.36	2.2846	10 2 29.8	9.532					
9	10 12 22.39	2.2832	9 52 56.0	9.594					
10	10 14 39.34	2.2818	9 43 18.5	9.655					
11	10 16 56.21	2.2805	9 33 37.4	9.715					
12	10 19 13.00	2.2792	9 23 52.7	9.774					
13	10 21 29.71	2.2779	9 14 4.5	9.832					
14	10 23 46.35	2.2767	9 4 12.9	9.888					
15	10 26 2.91	2.2753	8 54 17.9	9.945					
16	10 28 19.39	2.2741	8 44 19.5	10.000					
17	10 30 35.80	2.2730	8 34 17.9	10.053					
18	10 32 52.15	2.2718	8 24 13.1	10.106					
19	10 35 8.42	2.2707	8 14 5.2	10.158					
20	10 37 24.63	2.2696	8 3 54.1	10.210					
21	10 39 40.77	2.2684	7 53 40.0	10.259					
22	10 41 56.84	2.2674	7 43 23.0	10.308					
23	10 44 12.86	2.2664	N. 7 33 3.1	10.356					
WEDNESDAY 30.					☾ New Moon . . . . Nov. 7 3 36.7				
0	10 46 28.81	2.2653	N. 7 22 40.3	10.403	☾ First Quarter . . . . 14 12 35.5				
1	10 48 44.70	2.2644	7 12 14.7	10.449	☾ Full Moon . . . . 22 15 11.9				
2	10 51 0.54	2.2635	7 1 46.4	10.493	☾ Last Quarter . . . . 29 19 38.0				
3	10 53 16.32	2.2626	6 51 15.5	10.537	☾ Perigee . . . . Nov. 5 0.3 ☾ Apogee . . . . 16 18.9				
4	10 55 32.05	2.2618	6 40 42.0	10.580					
5	10 57 47.73	2.2608	6 30 5.9	10.622					
6	11 0 3.35	2.2600	6 19 27.3	10.663					
7	11 2 18.93	2.2593	6 8 46.3	10.703					
8	11 4 34.46	2.2585	5 58 3.0	10.741					
9	11 6 49.95	2.2578	5 47 17.4	10.778					
10	11 9 5.39	2.2570	5 36 29.6	10.815					
11	11 11 20.79	2.2563	5 25 39.6	10.851					
12	11 13 36.15	2.2557	5 14 47.5	10.885					
13	11 15 51.48	2.2552	5 3 53.4	10.918					
14	11 18 6.77	2.2546	4 52 57.4	10.950					
15	11 20 22.03	2.2541	4 41 59.4	10.982					
16	11 22 37.26	2.2536	4 30 59.6	11.011					
17	11 24 52.46	2.2532	4 19 58.1	11.040					
18	11 27 7.64	2.2528	4 8 54.8	11.068					
19	11 29 22.79	2.2523	3 57 49.9	11.095					
20	11 31 37.92	2.2520	3 46 43.4	11.121					
21	11 33 53.03	2.2517	3 35 35.4	11.145					
22	11 36 8.12	2.2514	3 24 26.0	11.168					
23	11 38 23.20	2.2512	3 13 15.2	11.191					
24	11 40 38.26	2.2509	N. 3 2 3.1	11.212					

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III <sup>h</sup>	P. L. of Diff.	VI <sup>h</sup>	P. L. of Diff.	IX <sup>h</sup>	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
1	Aldebaran	W.	66 54 23	2337	68 39 28	2326	70 24 49	2315	72 10 26	2305
	SUN	E.	83 8 22	2671	81 31 3	2659	79 53 28	2648	78 15 38	2636
2	Aldebaran	W.	81 2 24	2253	82 49 33	2243	84 36 57	2233	86 24 35	2223
	Pollux	W.	38 31 26	2454	40 13 44	2430	41 56 36	2408	43 40 0	2387
	SUN	E.	70 2 38	2582	68 23 18	2572	66 43 44	2561	65 3 56	2551
3	Aldebaran	W.	95 26 13	2180	97 15 11	2172	99 4 21	2165	100 53 42	2157
	Pollux	W.	52 23 45	2304	54 9 39	2291	55 55 52	2278	57 42 24	2266
	SUN	E.	56 41 41	2508	55 0 39	2500	53 19 26	2493	51 38 3	2487
4	Aldebaran	W.	110 2 57	2128	111 53 14	2124	113 43 37	2119	115 34 7	2116
	Pollux	W.	66 38 59	2220	68 26 56	2214	70 15 3	2207	72 3 20	2202
	SUN	E.	43 9 4	2462	41 26 57	2459	39 44 46	2457	38 2 32	2455
9	SUN	W.	25 2 43	2770	26 37 50	2781	28 12 43	2793	29 47 20	2806
	SATURN	E.	63 43 21	2401	61 59 47	2417	60 16 37	2434	58 33 51	2451
	Fomalhaut	E.	83 44 30	2719	82 8 16	2738	80 32 27	2758	78 57 4	2779
	α Pegasi	E.	98 33 32	2647	96 55 41	2662	95 18 10	2677	93 40 59	2692
10	SUN	W.	37 35 55	2881	39 8 38	2898	40 41 0	2915	42 13 0	2931
	SATURN	E.	50 6 5	2539	48 25 46	2557	46 45 52	2575	45 6 23	2594
	Fomalhaut	E.	71 7 14	2894	69 34 47	2920	68 2 53	2946	66 31 32	2973
	α Pegasi	E.	85 40 28	2779	84 5 32	2798	82 31 1	2816	80 56 54	2836
	JUPITER	E.	117 20 33	2477	115 38 47	2494	113 57 26	2512	112 16 29	2528
11	SUN	W.	49 47 35	3019	51 17 24	3036	52 46 52	3054	54 15 58	3071
	SATURN	E.	36 55 22	2689	35 18 27	2707	33 41 57	2728	32 5 54	2747
	Fomalhaut	E.	59 3 46	3127	57 36 9	3161	56 9 13	3198	54 43 1	3236
	α Pegasi	E.	73 12 56	2942	71 41 31	2965	70 10 34	2988	68 40 6	3011
	JUPITER	E.	103 57 36	2614	102 19 0	2631	100 10 47	2647	99 2 56	2664
	α Arietis	E.	116 32 58	2806	114 58 38	2820	113 24 36	2832	111 50 50	2846
12	SUN	W.	61 36 12	3156	63 3 14	3173	64 29 56	3188	65 56 19	3204
	Fomalhaut	E.	47 43 45	3454	46 22 30	3506	45 2 13	3561	43 42 56	3621
	α Pegasi	E.	61 15 15	3137	59 47 50	3164	58 20 58	3192	56 54 39	3220
	JUPITER	E.	90 59 12	2744	89 23 30	2760	87 48 9	2775	86 13 8	2788
	α Arietis	E.	104 6 22	2914	102 34 21	2927	101 2 37	2941	99 31 10	2954
13	SUN	W.	73 3 44	3277	74 28 22	3292	75 52 43	3304	77 16 50	3317
	Fomalhaut	E.	37 24 5	3999	36 12 24	4096	35 2 18	4204	33 53 56	4325
	α Pegasi	E.	49 51 55	3381	48 29 17	3417	47 7 20	3455	45 46 6	3497
	JUPITER	E.	78 22 37	2857	76 49 23	2870	75 16 26	2882	73 43 44	2894
	α Arietis	E.	91 58 7	3020	90 28 19	3033	88 58 47	3045	87 29 30	3056
	Aldebaran	E.	124 52 53	2892	123 20 24	2904	121 48 10	2916	120 16 12	2928
14	SUN	W.	84 13 52	3374	85 36 38	3385	86 59 12	3393	88 21 36	3402
	α Pegasi	E.	39 12 12	3746	37 56 14	3809	36 41 21	3878	35 27 39	3955
	JUPITER	E.	66 3 51	2947	64 32 32	2956	63 1 24	2965	61 30 27	2973
	α Arietis	E.	80 6 39	3114	78 38 46	3124	77 11 6	3134	75 43 38	3145
	Aldebaran	E.	112 39 56	2981	111 9 19	2990	109 38 54	2998	108 8 39	3006

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV <sup>h</sup>	P. L. of Diff.	XVIII <sup>h</sup>	P. L. of Diff.	XXI <sup>h</sup>	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
1	Aldebaran	W.	73 56 18	2294	75 42 26	2283	77 28 50	2273	79 15 29	2262
	SUN	E.	76 37 32	2625	74 59 11	2614	73 20 35	2603	71 41 44	2592
2	Aldebaran	W.	88 12 28	2274	90 0 35	2266	91 48 54	2196	93 37 27	2188
	Pollux	W.	45 23 53	2368	47 8 14	2350	48 53 0	2333	50 38 11	2317
	SUN	E.	63 23 54	2542	61 43 39	2533	60 3 12	2524	58 22 32	2516
3	Aldebaran	W.	102 43 14	2151	104 32 56	2145	106 22 47	2138	108 12 48	2133
	Pollux	W.	59 29 14	2256	61 16 19	2245	63 3 39	2236	64 51 13	2228
	SUN	E.	49 56 31	2480	48 14 50	2475	46 33 1	2470	44 51 6	2465
4	Aldebaran	W.	117 24 42	2113	119 15 22	2110	121 6 6	2109	122 56 52	2107
	Pollux	W.	73 51 45	2197	75 40 17	2194	77 28 54	2190	79 17 37	2187
	SUN	E.	36 20 16	2455	34 37 59	2456	32 55 44	2458	31 13 32	2460
9	SUN	W.	31 21 40	2820	32 55 42	2834	34 29 26	2848	36 2 51	2865
	SATURN	E.	56 51 29	2469	55 9 32	2485	53 27 58	2503	51 46 49	2521
	Fomalhaut	E.	77 22 9	2800	75 47 41	2822	74 13 42	2845	72 40 13	2869
	α Pegasi	E.	92 4 9	2708	90 27 40	2725	88 51 33	2742	87 15 49	2760
10	SUN	W.	43 44 39	2950	45 15 55	2966	46 46 50	2984	48 17 23	3001
	SATURN	E.	43 27 20	2612	41 48 42	2632	40 10 30	2650	38 32 43	2669
	Fomalhaut	E.	65 0 45	3001	63 30 34	3031	62 1 0	3061	60 32 3	3094
	α Pegasi	E.	79 23 13	2856	77 49 58	2877	76 17 10	2898	74 44 49	2920
	JUPITER	E.	110 35 55	2545	108 55 45	2563	107 15 59	2580	105 36 36	2596
11	SUN	W.	55 44 43	3089	57 13 6	3106	58 41 8	3123	60 8 50	3139
	SATURN	E.	30 30 16	2767	28 55 5	2788	27 20 21	2808	25 46 4	2830
	Fomalhaut	E.	53 17 34	3275	51 52 53	3315	50 28 59	3358	49 5 55	3406
	α Pegasi	E.	67 10 7	3035	65 40 38	3060	64 11 40	3085	62 43 12	3110
	JUPITER	E.	97 25 28	2661	95 48 22	2697	94 11 38	2713	92 35 15	2728
	α Arietis	E.	110 17 22	2859	108 44 11	2873	107 11 18	2886	105 38 41	2900
12	SUN	W.	67 22 24	3220	68 48 10	3235	70 13 38	3249	71 38 49	3263
	Fomalhaut	E.	42 24 44	3684	41 7 40	3753	39 51 49	3827	38 37 15	3910
	α Pegasi	E.	55 28 54	3250	54 3 44	3281	52 39 10	3313	51 15 13	3346
	JUPITER	E.	84 38 25	2803	83 4 1	2818	81 29 56	2831	79 56 8	2844
	α Arietis	E.	98 0 0	2968	96 29 7	2981	94 58 31	2994	93 28 11	3007
13	SUN	W.	78 40 42	3330	80 4 19	3341	81 27 43	3352	82 50 54	3364
	Fomalhaut	E.	32 47 26	4458	31 42 57	4609	30 40 40	4780	29 40 47	4971
	α Pegasi	E.	44 25 38	3540	43 5 58	3586	41 47 8	3635	40 29 11	3689
	JUPITER	E.	72 11 18	2905	70 39 6	2916	69 7 8	2927	67 35 23	2937
	α Arietis	E.	86 0 27	3069	84 31 39	3081	83 3 6	3091	81 34 46	3102
	Aldebaran	E.	118 44 29	2940	117 13 1	2950	115 41 46	2962	114 10 45	2971
14	SUN	W.	89 43 50	3411	91 5 54	3419	92 27 49	3427	93 49 35	3434
	α Pegasi	E.	34 15 15	4039	33 4 14	4133	31 54 44	4238	30 46 54	4355
	JUPITER	E.	59 59 40	2981	58 29 3	2989	56 58 36	2995	55 28 17	3001
	α Arietis	E.	74 16 23	3154	72 49 19	3164	71 22 27	3173	69 55 46	3182
	Aldebaran	E.	106 38 34	3014	105 8 39	3022	103 38 54	3029	102 9 17	3035

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	III <sup>h</sup>	P. L. of Diff.	VI <sup>h</sup>	P. L. of Diff.	IX <sup>h</sup>	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
15	SUN W.	95 11 13	3440	96 32 44	3446	97 54 8	3452	99 15 26	3457
	$\alpha$ Aquilæ W.	38 5 44	4457	39 10 14	4475	40 15 58	4300	41 22 51	4232
	JUPITER E.	53 58 6	3008	52 28 3	3013	50 58 6	3018	49 28 16	3022
	$\alpha$ Arietis E.	68 29 15	3191	67 2 55	3200	65 36 46	3209	64 10 47	3216
	Aldebaran E.	100 39 48	3041	99 10 26	3046	97 41 10	3051	96 12 0	3056
16	SUN W.	106 0 44	3474	107 21 37	3476	108 42 28	3478	110 3 17	3479
	$\alpha$ Aquilæ W.	47 11 31	3974	48 23 36	3934	49 36 21	3899	50 49 42	3865
	SATURN W.	24 46 37	3138	26 14 0	3135	27 41 27	3132	29 8 58	3129
	JUPITER E.	42 0 17	3039	40 30 52	3040	39 1 29	3042	37 32 8	3043
	$\alpha$ Arietis E.	57 3 16	3258	55 38 15	3265	54 13 23	3274	52 48 41	3283
	Aldebaran E.	88 47 21	3070	87 18 35	3071	85 49 50	3073	84 21 7	3073
17	SUN W.	116 47 17	3476	118 8 8	3475	119 29 0	3472	120 49 55	3471
	$\alpha$ Aquilæ W.	57 4 20	3727	58 20 38	3705	59 37 20	3683	60 54 25	3663
	SATURN W.	36 27 27	3113	37 55 21	3110	39 23 19	3105	40 51 22	3101
	JUPITER E.	30 5 30	3041	28 36 8	3040	27 6 45	3039	25 37 20	3036
	$\alpha$ Arietis E.	45 47 53	3332	44 24 19	3345	43 0 59	3358	41 37 54	3373
	Aldebaran E.	76 57 31	3069	75 28 44	3067	73 59 54	3065	72 31 1	3062
	Pollux E.	120 13 16	3173	118 46 34	3168	117 19 46	3162	115 52 51	3156
18	$\alpha$ Aquilæ W.	67 24 59	3574	68 44 2	3558	70 3 22	3543	71 22 59	3527
	SATURN W.	48 13 1	3076	49 41 40	3070	51 10 26	3064	52 39 20	3058
	Aldebaran E.	65 5 34	3042	63 36 13	3036	62 6 45	3031	60 37 11	3025
	Pollux E.	108 36 35	3128	107 8 59	3120	105 41 14	3114	104 13 21	3106
19	$\alpha$ Aquilæ W.	78 4 59	3462	79 26 6	3449	80 47 27	3438	82 9 1	3426
	SATURN W.	60 5 51	3022	61 35 37	3015	63 5 31	3006	64 35 36	2997
	$\alpha$ Pegasi W.	31 32 37	4133	32 42 7	4035	33 53 12	3947	35 5 44	3867
	Aldebaran E.	53 7 22	2992	51 36 59	2984	50 6 26	2977	48 35 44	2968
	Pollux E.	96 51 44	3069	95 22 57	3061	93 54 0	3053	92 24 53	3045
20	$\alpha$ Aquilæ W.	88 59 55	3376	90 22 39	3366	91 45 34	3358	93 8 38	3350
	SATURN W.	72 8 42	2954	73 39 53	2944	75 11 16	2935	76 42 51	2925
	$\alpha$ Pegasi W.	41 26 22	3571	42 45 28	3525	44 5 24	3483	45 26 7	3444
	Aldebaran E.	40 59 34	2925	39 27 47	2916	37 55 49	2907	36 23 39	2897
	Pollux E.	84 56 43	3002	83 26 33	2993	81 56 12	2985	80 25 40	2977
	Regulus E.	121 4 49	2928	119 33 6	2919	118 1 11	2909	116 29 4	2900
21	$\alpha$ Aquilæ W.	100 6 8	3318	101 29 59	3313	102 53 56	3309	104 17 57	3306
	SATURN W.	84 23 49	2876	85 56 38	2866	87 29 40	2856	89 2 55	2845
	$\alpha$ Pegasi W.	52 19 51	3282	53 44 23	3256	55 9 26	3230	56 35 0	3205
	Aldebaran E.	28 39 43	2848	27 6 18	2838	25 32 40	2828	23 58 49	2819
	Pollux E.	72 50 18	2933	71 18 41	2924	69 46 53	2916	68 14 54	2908
	Regulus E.	108 45 24	2851	107 12 2	2841	105 38 27	2830	104 4 38	2821
22	SATURN W.	96 52 28	2795	98 27 2	2785	100 1 49	2775	101 36 49	2765
	$\alpha$ Pegasi W.	63 49 37	3101	65 17 46	3082	66 46 17	3064	68 15 11	3047
	JUPITER W.	31 15 9	2746	32 50 48	2735	34 26 41	2725	36 2 48	2715
	Pollux E.	60 32 29	2870	58 59 32	2863	57 26 26	2857	55 53 12	2852
	Regulus E.	96 12 20	2769	94 37 12	2760	93 1 51	2750	91 26 17	2739

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV <sup>h</sup>	P. L. of Diff.	XVIII <sup>h</sup>	P. L. of Diff.	XXI <sup>h</sup>	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
15	SUN	W.	100 36 38	3461	101 57 46	3465	103 18 49	3469	104 39 48	3471
	α Aquilæ	W.	42 30 47	4171	43 39 41	4113	44 49 30	4063	46 0 8	4017
	JUPITER	E.	47 58 31	3026	46 28 51	3030	44 59 16	3034	43 29 45	3036
	α Arietis	E.	62 44 57	3225	61 19 17	3233	59 53 47	3242	58 28 27	3249
	Aldebaran	E.	94 42 56	3060	93 13 57	3062	91 45 1	3065	90 16 9	3069
16	SUN	W.	111 24 5	3480	112 44 52	3479	114 5 40	3479	115 26 28	3478
	α Aquilæ	W.	52 3 37	3834	53 18 4	3805	54 33 1	3777	55 48 27	3751
	SATURN	W.	30 36 32	3126	32 4 10	3124	33 31 51	3119	34 59 37	3116
	JUPITER	E.	36 2 48	3043	34 33 28	3044	33 4 10	3043	31 34 50	3043
	α Arietis	E.	51 24 10	3292	49 59 49	3300	48 35 38	3311	47 11 39	3322
	Aldebaran	E.	82 52 24	3073	81 23 42	3073	79 54 59	3073	78 26 16	3071
17	SUN	W.	122 10 52	3467	123 31 53	3464	124 52 57	3461	126 14 5	3456
	α Aquilæ	W.	62 11 52	3644	63 29 39	3624	64 47 47	3607	66 6 14	3590
	SATURN	W.	42 19 31	3096	43 47 45	3092	45 16 4	3087	46 44 29	3082
	JUPITER	E.	24 7 52	3034	22 38 22	3032	21 8 49	3029	19 39 12	3026
	α Arietis	E.	40 15 7	3390	38 52 39	3407	37 30 30	3427	36 8 44	3451
	Aldebaran	E.	71 2 5	3059	69 33 5	3055	68 4 0	3051	66 34 50	3046
	Pollux	E.	114 25 49	3151	112 58 41	3145	111 31 26	3139	110 4 4	3133
18	α Aquilæ	W.	72 42 53	3514	74 3 2	3500	75 23 26	3487	76 44 5	3473
	SATURN	W.	54 8 21	3052	55 37 30	3044	57 6 48	3037	58 36 15	3030
	Aldebaran	E.	59 7 29	3019	57 37 40	3012	56 7 42	3005	54 37 36	2999
	Pollux	E.	102 45 19	3100	101 17 9	3092	99 48 50	3085	98 20 22	3077
19	α Aquilæ	W.	83 30 48	3415	84 52 47	3405	86 14 58	3394	87 37 21	3385
	SATURN	W.	66 5 52	2989	67 36 18	2981	69 6 55	2972	70 37 43	2963
	α Pegasi	W.	36 19 37	3796	37 34 43	3733	38 50 55	3675	40 8 9	3620
	Aldebaran	E.	47 4 51	2960	45 33 48	2951	44 2 34	2943	42 31 10	2934
	Pollux	E.	90 55 36	3037	89 26 9	3028	87 56 31	3019	86 26 42	3011
20	α Aquilæ	W.	94 31 52	3343	95 55 14	3335	97 18 45	3329	98 42 23	3323
	SATURN	W.	78 14 38	2916	79 46 37	2906	81 18 48	2896	82 51 12	2886
	α Pegasi	W.	46 47 34	3408	48 9 42	3374	49 32 28	3341	50 55 52	3311
	Aldebaran	E.	34 51 16	2888	33 18 42	2878	31 45 55	2868	30 12 55	2859
	Pollux	E.	78 54 58	2967	77 24 4	2959	75 53 0	2950	74 21 44	2942
	Regulus	E.	114 56 45	2891	113 24 14	2880	111 51 30	2870	110 18 33	2861
21	α Aquilæ	W.	105 42 2	3304	107 6 9	3302	108 30 18	3301	109 54 28	3301
	SATURN	W.	90 36 24	2836	92 10 5	2826	93 43 59	2815	95 18 7	2805
	α Pegasi	W.	58 1 3	3183	59 27 32	3160	60 54 29	3139	62 21 51	3119
	Aldebaran	E.	22 24 46	2808	20 50 29	2799	19 16 0	2789	17 41 18	2779
	Pollux	E.	66 42 45	2899	65 10 25	2892	63 37 56	2884	62 5 17	2877
	Regulus	E.	102 30 37	2810	100 56 22	2801	99 21 55	2790	97 47 14	2780
22	SATURN	W.	103 12 3	2756	104 47 29	2746	106 23 8	2736	107 59 0	2727
	α Pegasi	W.	69 44 25	3031	71 13 59	3015	72 43 53	3000	74 14 6	2986
	JUPITER	W.	37 39 8	2705	39 15 41	2695	40 52 28	2685	42 29 28	2675
	Pollux	E.	54 19 51	2845	52 46 22	2842	51 12 48	2838	49 39 9	2833
	Regulus	E.	89 50 29	2729	88 14 28	2719	86 38 14	2710	85 1 47	2700

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
23	SATURN W.	109 35 4	2717	111 11 21	2707	112 47 51	2698	114 24 34	2689
	α Pegasi W.	75 44 36	2973	77 15 23	2959	78 46 27	2946	80 17 47	2934
	JUPITER W.	44 6 42	2665	45 44 9	2656	47 21 48	2646	48 59 40	2637
	α Arietis W.	32 20 34	3151	33 47 42	3105	35 15 46	3063	36 44 41	3024
	Pollux E.	48 5 24	2831	46 31 36	2828	44 57 45	2828	43 23 54	2828
	Regulus E.	83 25 7	2690	81 48 14	2681	80 11 8	2671	78 33 49	2661
	MARS E.	116 45 55	2887	115 13 20	2876	113 40 31	2866	112 7 29	2857
24	α Pegasi W.	87 58 3	2882	89 30 45	2873	91 3 38	2865	92 36 42	2857
	JUPITER W.	57 12 9	2591	58 51 16	2583	60 30 34	2574	62 10 4	2566
	α Arietis W.	44 19 55	2877	45 52 43	2853	47 26 2	2831	48 59 49	2812
	Regulus E.	70 24 7	2616	68 45 34	2607	67 6 48	2599	65 27 51	2590
	MARS E.	104 19 13	2809	102 44 57	2799	101 10 28	2790	99 35 47	2781
	Spica E.	123 53 35	2638	122 15 32	2628	120 37 15	2618	118 58 45	2609
25	α Pegasi W.	100 24 18	2826	101 58 12	2822	103 32 11	2818	105 6 15	2816
	JUPITER W.	70 30 27	2525	72 11 5	2518	73 51 53	2510	75 32 52	2502
	α Arietis W.	56 54 42	2729	58 30 44	2714	60 7 5	2700	61 43 45	2687
	Aldebaran W.	22 57 54	2547	24 38 2	2539	26 18 21	2531	27 58 51	2524
	Regulus E.	57 10 15	2549	55 30 10	2542	53 49 55	2534	52 9 29	2527
	MARS E.	91 39 31	2738	90 3 42	2730	88 27 42	2722	86 51 31	2714
	Spica E.	110 43 11	2565	109 3 28	2558	107 23 35	2549	105 43 30	2541
26	JUPITER W.	84 0 21	2467	85 42 20	2460	87 24 29	2454	89 6 47	2447
	α Arietis W.	69 51 5	2632	71 29 17	2622	73 7 41	2613	74 46 19	2604
	Aldebaran W.	36 23 56	2487	38 5 28	2481	39 47 8	2473	41 28 59	2466
	Regulus E.	43 44 50	2492	42 3 25	2485	40 21 51	2478	38 40 7	2472
	MARS E.	78 48 0	2676	77 10 48	2669	75 33 26	2662	73 55 54	2655
	Spica E.	97 20 27	2504	95 39 20	2497	93 58 3	2490	92 16 36	2483
27	JUPITER W.	97 40 36	2416	99 23 48	2410	101 7 9	2404	102 50 38	2398
	α Arietis W.	83 2 20	2565	84 42 4	2558	86 21 57	2551	88 1 59	2545
	Aldebaran W.	50 0 33	2434	51 43 19	2429	53 26 13	2422	55 9 17	2416
	MARS E.	65 45 55	2621	64 7 28	2614	62 28 53	2607	60 50 8	2601
	Spica E.	83 47 3	2452	82 4 42	2446	80 22 12	2440	78 39 34	2434
	SUN E.	126 8 30	2793	124 33 53	2785	122 59 6	2778	121 24 10	2771
28	α Arietis W.	96 24 12	2518	98 5 0	2514	99 45 54	2510	101 26 54	2505
	Aldebaran W.	63 46 41	2387	65 30 34	2381	67 14 36	2375	68 58 46	2371
	MARS E.	52 34 18	2571	50 54 43	2565	49 15 0	2559	47 35 9	2553
	Spica E.	70 4 24	2407	68 20 59	2402	66 37 27	2397	64 53 48	2392
	SUN E.	113 27 8	2738	111 51 18	2731	110 15 19	2724	108 39 11	2718
29	Aldebaran W.	77 41 29	2344	79 26 25	2339	81 11 27	2334	82 56 37	2328
	MARS E.	39 13 57	2526	37 33 20	2520	35 52 35	2515	34 11 43	2510
	Spica E.	56 13 50	2370	54 29 32	2366	52 45 8	2362	51 0 38	2359
	SUN E.	100 36 31	2689	98 59 36	2683	97 22 33	2678	95 45 23	2672
30	Aldebaran W.	91 44 13	2306	93 30 4	2301	95 16 2	2297	97 2 6	2293
	MARS E.	25 45 39	2486	24 4 6	2481	22 22 26	2477	20 40 40	2472
	Spica E.	42 17 5	2346	40 32 12	2344	38 47 17	2344	37 2 21	2343
	SUN E.	87 37 49	2647	85 59 58	2643	84 22 1	2638	82 43 58	2633



## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
23	SATURN • W.	116 1 29	2681	117 38 35	2672	119 15 53	2663	120 53 23	2653
	α Pegasi W.	81 49 23	2923	83 21 13	2912	84 53 16	2901	86 25 33	2891
	JUPITER W.	50 37 45	2628	52 16 2	2619	53 54 32	2610	55 33 14	2600
	α Arietis W.	38 14 24	2989	39 44 50	2958	41 15 56	2929	42 47 39	2902
	Pollux E.	41 50 3	2830	40 16 14	2834	38 42 30	2839	37 8 53	2845
	Regulus E.	76 56 17	2652	75 18 33	2643	73 40 37	2634	72 2 28	2625
	MARS E.	110 34 15	2847	109 0 48	2838	107 27 9	2828	105 53 17	2818
24	α Pegasi W.	94 9 56	2850	95 43 19	2843	97 16 51	2837	98 50 31	2831
	JUPITER W.	63 49 46	2558	65 29 39	2549	67 9 44	2541	68 50 0	2533
	α Arietis W.	50 34 1	2794	52 8 37	2775	53 43 37	2759	55 18 59	2744
	Regulus E.	63 48 42	2582	62 9 22	2574	60 29 51	2566	58 50 9	2557
	MARS E.	98 0 55	2772	96 25 51	2764	94 50 36	2755	93 15 9	2747
	Spica E.	117 20 2	2601	115 41 8	2593	114 2 1	2583	112 22 42	2574
25	α Pegasi W.	106 40 22	2814	108 14 32	2812	109 48 44	2811	111 22 57	2811
	JUPITER W.	77 14 2	2496	78 55 21	2488	80 36 51	2481	82 18 31	2474
	α Arietis W.	63 20 42	2675	64 57 55	2663	66 35 24	2653	68 13 7	2642
	Aldebaran W.	29 39 31	2516	31 20 22	2509	33 1 23	2502	34 42 34	2494
	Regulus E.	50 28 53	2520	48 48 7	2512	47 7 11	2505	45 26 5	2499
	MARS E.	85 15 9	2706	83 38 37	2698	82 1 55	2691	80 25 3	2683
	Spica E.	104 3 14	2531	102 22 48	2526	100 42 11	2519	99 1 24	2512
26	JUPITER W.	90 49 15	2441	92 31 52	2435	94 14 37	2428	95 57 32	2422
	α Arietis W.	76 25 9	2596	78 4 10	2588	79 43 23	2580	81 22 46	2572
	Aldebaran W.	43 11 0	2460	44 53 9	2453	46 35 28	2447	48 17 56	2441
	Regulus E.	36 58 15	2466	35 16 14	2460	33 34 5	2455	31 51 48	2449
	MARS E.	72 18 13	2647	70 40 22	2641	69 2 23	2634	67 24 14	2627
	Spica E.	90 34 59	2477	88 53 13	2471	87 11 19	2464	85 29 15	2458
27	JUPITER W.	104 34 15	2392	106 18 1	2387	108 1 55	2381	109 45 57	2375
	α Arietis W.	89 42 10	2539	91 22 29	2533	93 2 56	2528	94 43 30	2522
	Aldebaran W.	56 52 29	2410	58 35 49	2404	60 19 18	2398	62 2 55	2392
	MARS E.	59 11 15	2595	57 32 13	2589	55 53 3	2583	54 13 45	2577
	Spica E.	76 56 48	2429	75 13 54	2423	73 30 52	2417	71 47 42	2412
	SUN E.	119 49 4	2764	118 13 49	2757	116 38 24	2750	115 2 50	2744
28	α Arietis W.	103 8 0	2502	104 49 10	2499	106 30 25	2497	108 11 43	2494
	Aldebaran W.	70 43 3	2365	72 27 28	2360	74 12 0	2354	75 56 41	2349
	MARS E.	45 55 10	2548	44 15 3	2543	42 34 49	2537	40 54 27	2531
	Spica E.	63 10 1	2387	61 26 8	2382	59 42 8	2378	57 58 2	2374
	SUN E.	107 2 55	2712	105 26 31	2706	103 49 59	2700	102 13 19	2694
29	Aldebaran W.	84 41 55	2324	86 27 19	2320	88 12 50	2315	89 58 28	2310
	MARS E.	32 30 44	2505	30 49 38	2500	29 8 25	2495	27 27 5	2491
	Spica E.	49 16 4	2356	47 31 25	2353	45 46 42	2350	44 1 55	2348
	SUN E.	94 8 6	2667	92 30 42	2662	90 53 11	2657	89 15 33	2652
30	Aldebaran W.	98 48 17	2289	100 34 33	2285	102 20 55	2281	104 7 23	2277
	MARS E.	18 58 48	2467	17 16 49	2464	15 34 45	2461	13 52 36	2458
	Spica E.	35 17 24	2344	33 32 29	2346	31 47 36	2348	30 2 46	2351
	SUN E.	81 5 48	2629	79 27 33	2625	77 49 12	2621	76 10 45	2616

## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from		Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.		Added to Apparent Time.		
		h m s	s	° ' "	"	' "	s	m s	s	
Thur.	1	16 28 40.63	10.795	S. 21 47 24.3	-23.49	16 15.37	70.24	10 56.49	0.936	
Frid.	2	16 33 0.04	10.822	21 56 35.5	22.44	16 15.51	70.32	10 33.70	0.963	
Sat.	3	16 37 20.10	10.849	22 5 21.5	21.38	16 15.65	70.40	10 10.26	0.990	
SUN.	4	16 41 40.78	10.874	22 13 41.9	-20.31	16 15.79	70.48	9 46.20	1.015	
Mon.	5	16 46 2.05	10.898	22 21 36.4	19.23	16 15.92	70.56	9 21.55	1.039	
Tues.	6	16 50 23.89	10.921	22 29 4.9	18.14	16 16.05	70.63	8 56.34	1.062	
Wed.	7	16 54 46.26	10.943	22 36 7.1	-17.04	16 16.18	70.70	8 30.59	1.083	
Thur.	8	16 59 9.13	10.963	22 42 42.7	15.93	16 16.31	70.77	8 4.35	1.103	
Frid.	9	17 3 32.47	10.981	22 48 51.5	14.81	16 16.43	70.84	7 37.64	1.122	
Sat.	10	17 7 56.24	10.999	22 54 33.4	-13.68	16 16.54	70.90	7 10.50	1.139	
SUN.	11	17 12 20.43	11.015	22 59 48.0	12.54	16 16.66	70.95	6 42.95	1.156	
Mon.	12	17 16 44.98	11.030	23 4 35.4	11.40	16 16.77	71.00	6 15.03	1.170	
Tues.	13	17 21 9.87	11.043	23 8 55.2	-10.25	16 16.88	71.04	5 46.78	1.184	
Wed.	14	17 25 35.06	11.055	23 12 47.3	9.09	16 16.98	71.08	5 18.22	1.196	
Thur.	15	17 30 0.53	11.066	23 16 11.7	7.93	16 17.08	71.12	4 49.39	1.206	
Frid.	16	17 34 26.24	11.076	23 19 8.1	-6.77	16 17.17	71.15	4 20.31	1.216	
Sat.	17	17 38 52.16	11.084	23 21 36.5	5.60	16 17.26	71.18	3 51.02	1.224	
SUN.	18	17 43 18.25	11.090	23 23 36.9	4.43	16 17.34	71.21	3 21.57	1.230	
Mon.	19	17 47 44.49	11.095	23 25 9.0	-3.25	16 17.42	71.23	2 51.97	1.236	
Tues.	20	17 52 10.84	11.100	23 26 12.9	2.07	16 17.49	71.24	2 22.25	1.240	
Wed.	21	17 56 37.28	11.103	23 26 48.6	-0.89	16 17.55	71.25	1 52.46	1.242	
Thur.	22	18 1 3.76	11.104	23 26 55.9	+0.29	16 17.61	71.26	1 22.62	1.244	
Frid.	23	18 5 30.26	11.104	23 26 35.0	1.46	16 17.66	71.26	0 52.75	1.244	
Sat.	24	18 9 56.76	11.103	23 25 45.7	2.64	16 17.71	71.26	0 22.90	1.243	
SUN.	25	18 14 23.22	11.101	23 24 28.2	+3.82	16 17.75	71.25	0 6.91	1.241	
Mon.	26	18 18 49.61	11.098	23 22 42.4	5.00	16 17.78	71.24	0 36.66	1.238	
Tues.	27	18 23 15.90	11.093	23 20 28.4	6.17	16 17.80	71.22	1 6.32	1.233	
Wed.	28	18 27 42.06	11.087	23 17 46.2	+7.34	16 17.82	71.20	1 35.85	1.227	
Thur.	29	18 32 8.06	11.079	23 14 36.0	8.51	16 17.84	71.17	2 5.21	1.219	
Frid.	30	18 36 33.87	11.071	23 10 57.7	9.67	16 17.85	71.14	2 34.38	1.211	
Sat.	31	18 40 59.46	11.061	23 6 51.6	10.83	16 17.85	71.10	3 3.33	1.201	
SUN.	32	18 45 24.77	11.050	S. 23 2 17.8	+11.98	16 17.85	71.05	3 32.01	1.189	

NOTE.—The mean time of semidiameter passing the meridian may be found by subtracting 0.19 from the sidereal time.  
 The sign — prefixed to the hourly change of declination indicates that south declinations are increasing;  
 the sign + indicates that south declinations are decreasing.

## AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to		Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Subtracted from Mean Time.			
Thur.	1	<sup>h</sup> 16 <sup>m</sup> 28 <sup>s</sup> 42.60	<sup>s</sup> 10.792	<sup>°</sup> S. 21 <sup>'</sup> 47 <sup>"</sup> 28.6	<sup>"</sup> -23.48	<sup>m</sup> 10 <sup>s</sup> 56.32	<sup>s</sup> 0.936	<sup>h</sup> 16 <sup>m</sup> 39 <sup>s</sup> 38.91	
Frid.	2	16 33 1.94	10.820	21 56 39.5	22.43	10 33.53	0.963	16 43 35.47	
Sat.	3	16 37 21.94	10.846	22 5 25.1	21.37	10 10.09	0.990	16 47 32.02	
SUN.	4	16 41 42.55	10.871	22 13 45.2	-20.30	9 46.04	1.015	16 51 28.58	
Mon.	5	16 46 3.75	10.895	22 21 39.4	19.22	9 21.39	1.039	16 55 25.14	
Tues.	6	16 50 25.51	10.918	22 29 7.6	18.13	8 56.18	1.062	16 59 21.69	
Wed.	7	16 54 47.81	10.940	22 36 9.5	-17.03	8 30.44	1.083	17 3 18.25	
Thur.	8	16 59 10.60	10.960	22 42 44.8	15.92	8 4.21	1.103	17 7 14.81	
Frid.	9	17 3 33.86	10.978	22 48 53.4	14.80	7 37.50	1.122	17 11 11.36	
Sat.	10	17 7 57.56	10.996	22 54 35.0	-13.67	7 10.36	1.139	17 15 7.92	
SUN.	11	17 12 21.66	11.012	22 59 49.4	12.53	6 42.82	1.155	17 19 4.48	
Mon.	12	17 16 46.12	11.027	23 4 36.6	11.39	6 14.91	1.170	17 23 1.04	
Tues.	13	17 21 10.93	11.040	23 8 56.2	-10.24	5 46.66	1.183	17 26 57.59	
Wed.	14	17 25 36.04	11.052	23 12 48.2	9.09	5 18.11	1.195	17 30 54.15	
Thur.	15	17 30 1.42	11.063	23 16 12.3	7.93	4 49.29	1.206	17 34 50.71	
Frid.	16	17 34 27.04	11.072	23 19 8.6	-6.77	4 20.22	1.215	17 38 47.27	
Sat.	17	17 38 52.87	11.080	23 21 36.9	5.60	3 50.95	1.223	17 42 43.82	
SUN.	18	17 43 18.88	11.086	23 23 37.1	4.42	3 21.51	1.230	17 46 40.38	
Mon.	19	17 47 45.02	11.092	23 25 9.2	-3.25	2 51.92	1.235	17 50 36.94	
Tues.	20	17 52 11.28	11.096	23 26 13.0	2.07	2 22.21	1.240	17 54 33.50	
Wed.	21	17 56 37.62	11.099	23 26 48.6	-0.90	1 52.43	1.242	17 58 30.05	
Thur.	22	18 1 4.01	11.100	23 26 56.0	+0.28	1 22.60	1.244	18 2 26.61	
Frid.	23	18 5 30.43	11.100	23 26 35.0	1.46	0 52.74	1.244	18 6 23.17	
Sat.	24	18 9 56.83	11.099	23 25 45.7	2.64	0 22.89	1.243	18 10 19.72	
SUN.	25	18 14 23.20	11.097	23 24 28.2	+3.82	0 6.91	1.240	18 14 16.28	
Mon.	26	18 18 49.49	11.094	23 22 42.4	4.99	0 36.65	1.237	18 18 12.84	
Tues.	27	18 23 15.69	11.089	23 20 28.5	6.17	1 6.30	1.233	18 22 9.40	
Wed.	28	18 27 41.76	11.083	23 17 46.4	+7.34	1 35.82	1.227	18 26 5.95	
Thur.	29	18 32 7.68	11.076	23 14 36.2	8.51	2 5.17	1.219	18 30 2.51	
Frid.	30	18 36 33.40	11.067	23 10 58.1	9.67	2 34.33	1.210	18 33 59.07	
Sat.	31	18 40 58.89	11.057	23 6 52.2	10.83	3 3.27	1.200	18 37 55.62	
SUN.	32	18 45 24.12	11.046	S. 23 2 18.5	+11.98	3 31.94	1.189	18 41 52.18	

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.

The sign — prefixed to the hourly change of declination indicates that south declinations are increasing; the sign + indicates that south declinations are decreasing.

Diff. for 1 Hour,  
+ 9<sup>m</sup> 85<sup>s</sup> 65.  
(Table III.)

AT GREENWICH MEAN NOON.									
Day of the Month.	Day of the Year.	THE SUN'S					Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.				
		$\lambda$	$\lambda'$						
1	336	248 53 44.4	53 4.1	152.14	+ 0.42	9.993 7827	- 27.1	h m s 7 19 8.95	
2	337	249 54 36.5	53 56.1	152.20	0.55	9.993 7185	26.4	7 15 13.04	
3	338	250 55 30.0	54 49.4	152.26	0.67	9.993 6559	25.8	7 11 17.13	
4	339	251 56 24.8	55 44.0	152.31	+ 0.76	9.993 5947	- 25.2	7 7 21.22	
5	340	252 57 20.8	56 39.9	152.36	0.82	9.993 5350	24.6	7 3 25.31	
6	341	253 58 17.9	57 36.9	152.40	0.85	9.993 4767	24.0	6 59 29.39	
7	342	254 59 16.1	58 34.9	152.44	+ 0.85	9.993 4197	- 23.5	6 55 33.48	
8	343	255 60 15.2	59 33.8	152.48	0.83	9.993 3641	22.9	6 51 37.57	
9	344	257 1 15.2	0 33.6	152.51	0.78	9.993 3099	22.3	6 47 41.66	
10	345	258 2 15.9	1 34.1	152.54	+ 0.70	9.993 2572	- 21.6	6 43 45.75	
11	346	259 3 17.2	2 35.3	152.57	0.60	9.993 2062	20.9	6 39 49.84	
12	347	260 4 19.1	3 37.0	152.59	0.48	9.993 1569	20.2	6 35 53.93	
13	348	261 5 21.6	4 39.3	152.61	+ 0.35	9.993 1094	- 19.4	6 31 58.02	
14	349	262 6 24.5	5 42.0	152.63	0.23	9.993 0640	18.5	6 28 2.11	
15	350	263 7 27.8	6 45.2	152.65	+ 0.11	9.993 0206	17.6	6 24 6.19	
16	351	264 8 31.6	7 48.8	152.67	- 0.01	9.992 9794	- 16.7	6 20 10.28	
17	352	265 9 35.7	8 52.8	152.68	0.10	9.992 9406	15.7	6 16 14.37	
18	353	266 10 40.2	9 57.2	152.69	0.19	9.992 9041	14.7	6 12 18.46	
19	354	267 11 45.1	11 1.9	152.71	- 0.25	9.992 8702	- 13.6	6 8 22.55	
20	355	268 12 50.3	12 6.9	152.72	0.28	9.992 8390	12.5	6 4 26.64	
21	356	269 13 55.8	13 12.2	152.74	0.29	9.992 8104	11.3	6 0 30.72	
22	357	270 15 1.7	14 18.0	152.75	- 0.27	9.992 7846	- 10.1	5 56 34.81	
23	358	271 16 8.0	15 24.1	152.77	0.23	9.992 7617	9.0	5 52 38.90	
24	359	272 17 14.7	16 30.6	152.79	0.17	9.992 7417	7.8	5 48 42.99	
25	360	273 18 21.9	17 37.6	152.81	- 0.07	9.992 7245	- 6.6	5 44 47.08	
26	361	274 19 29.6	18 45.1	152.83	+ 0.05	9.992 7100	5.5	5 40 51.17	
27	362	275 20 37.7	19 53.1	152.85	+ 0.18	9.992 6982	4.4	5 36 55.26	
28	363	276 21 46.3	21 1.6	152.87	+ 0.30	9.992 6890	- 3.3	5 32 59.35	
29	364	277 22 55.5	22 10.6	152.89	0.43	9.992 6822	2.3	5 29 3.43	
30	365	278 24 5.1	23 20.0	152.91	0.55	9.992 6777	1.4	5 25 7.52	
31	366	279 25 15.1	24 29.8	152.92	0.64	9.992 6754	- 0.6	5 21 11.61	
32	367	280 26 25.5	25 40.0	152.94	+ 0.71	9.992 6750	+ 0.2	5 17 15.70	

NOTE.—The longitudes in the column  $\lambda$  are referred to the true equinox of their own date, while those in the column  $\lambda'$  are referred to the mean equinox of the beginning of the Besselian fictitious year.

Diff. for 1 Hour,  
— 9<sup>h</sup>.8296.  
(Table II.)

## GREENWICH MEAN TIME.

## THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
							h m	m	d
1	16 12.1	16 13.2	59 21.7	+ 0.40	59 25.9	+ 0.29	19 42.1	2.17	23.8
2	16 14.0	16 14.2	59 28.6	+ 0.15	59 29.5	0.00	20 34.4	2.20	24.8
3	16 13.9	16 13.1	59 28.6	- 0.16	59 25.5	- 0.35	21 27.5	2.24	25.8
4	16 11.7	16 9.5	59 20.2	- 0.55	59 12.5	- 0.73	22 21.8	2.28	26.8
5	16 6.8	16 3.5	59 2.5	0.92	58 50.3	1.11	23 17.0	2.31	27.8
6	15 59.6	15 55.2	58 35.9	1.28	58 19.6	1.43	6		28.8
7	15 50.2	15 44.9	58 1.5	- 1.56	57 42.1	- 1.65	0 12.5	2.31	0.3
8	15 39.4	15 33.7	57 21.7	1.73	57 0.7	1.75	1 7.5	2.26	1.3
9	15 27.9	15 22.2	56 39.5	1.75	56 18.6	1.72	2 1.0	2.18	2.3
10	15 16.7	15 11.5	55 58.3	- 1.65	55 39.1	- 1.55	2 52.2	2.08	3.3
11	15 6.6	15 2.1	55 21.1	1.43	55 4.9	1.28	3 40.9	1.97	4.3
12	14 58.2	14 54.9	54 50.5	1.10	54 38.4	0.91	4 27.1	1.88	5.3
13	14 52.2	14 50.2	54 28.5	- 0.71	54 21.2	- 0.50	5 11.3	1.81	6.3
14	14 48.9	14 48.4	54 16.4	- 0.28	54 14.3	- 0.05	5 54.1	1.77	7.3
15	14 48.5	14 49.4	54 14.9	+ 0.15	54 18.0	+ 0.37	6 36.3	1.76	8.3
16	14 51.0	14 53.2	54 23.8	+ 0.59	54 32.1	+ 0.78	7 18.7	1.78	9.3
17	14 56.1	14 59.6	54 42.6	0.97	54 55.4	1.14	8 2.0	1.84	10.3
18	15 3.6	15 8.0	55 10.1	1.29	55 26.5	1.42	8 47.1	1.92	11.3
19	15 12.9	15 18.0	55 44.2	+ 1.52	56 3.1	+ 1.60	9 34.5	2.03	12.3
20	15 23.3	15 28.8	56 22.7	1.65	56 42.7	1.66	10 24.6	2.15	13.3
21	15 34.2	15 39.5	57 2.7	1.64	57 22.2	1.59	11 17.5	2.25	14.3
22	15 44.6	15 49.5	57 41.1	+ 1.52	57 58.8	+ 1.43	12 12.5	2.32	15.3
23	15 54.0	15 58.0	58 15.2	1.30	58 30.0	1.15	13 8.8	2.35	16.3
24	16 1.5	16 4.5	58 43.0	1.00	58 54.0	0.83	14 5.3	2.34	17.3
25	16 6.9	16 8.8	59 3.0	+ 0.66	59 10.0	+ 0.50	15 0.9	2.29	18.3
26	16 10.2	16 11.1	59 15.0	0.34	59 18.2	+ 0.19	15 55.1	2.23	19.3
27	16 11.5	16 11.5	59 19.7	+ 0.05	59 19.6	- 0.07	16 47.9	2.18	20.3
28	16 11.1	16 10.3	59 18.0	- 0.18	59 15.2	- 0.28	17 39.7	2.15	21.3
29	16 9.2	16 7.8	59 11.2	0.37	59 6.2	0.46	18 31.0	2.14	22.3
30	16 6.2	16 4.3	59 0.2	0.53	58 53.3	0.61	19 22.5	2.16	23.3
31	16 2.2	15 59.9	58 45.5	0.68	58 36.8	0.75	20 14.8	2.20	24.3
32	15 57.3	15 54.4	58 27.3	- 0.83	58 16.8	- 0.91	21 8.0	2.19	25.3

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 1.					SATURDAY 3.				
0	11 40 38.26	2.2509	N. 3 2 3.1	11.212	0	13 29 10.35	2.2848	S. 5 58 51.3	10.876
1	11 42 53.31	2.2508	2 50 49.8	11.232	1	13 31 27.48	2.2862	6 9 42.8	10.841
2	11 45 8.36	2.2507	2 39 35.3	11.251	2	13 33 44.69	2.2877	6 20 32.2	10.804
3	11 47 23.40	2.2506	2 28 19.7	11.269	3	13 36 2.00	2.2893	6 31 19.3	10.765
4	11 49 38.43	2.2505	2 17 3.0	11.286	4	13 38 19.40	2.2908	6 42 4.0	10.726
5	11 51 53.46	2.2506	2 5 45.4	11.301	5	13 40 36.89	2.2923	6 52 46.4	10.686
6	11 54 8.50	2.2507	1 54 26.9	11.316	6	13 42 54.48	2.2939	7 3 26.3	10.643
7	11 56 23.54	2.2508	1 43 7.5	11.330	7	13 45 12.16	2.2955	7 14 3.6	10.600
8	11 58 38.59	2.2508	1 31 47.3	11.344	8	13 47 29.94	2.2972	7 24 38.3	10.557
9	12 0 53.64	2.2509	1 20 26.5	11.353	9	13 49 47.82	2.2988	7 35 10.4	10.512
10	12 3 8.70	2.2512	1 9 5.0	11.363	10	13 52 5.80	2.3005	7 45 39.7	10.465
11	12 5 23.78	2.2514	0 57 43.0	11.372	11	13 54 23.88	2.3022	7 56 6.2	10.417
12	12 7 38.87	2.2517	0 46 20.4	11.380	12	13 56 42.06	2.3038	8 6 29.7	10.368
13	12 9 53.98	2.2519	0 34 57.4	11.386	13	13 59 0.34	2.3056	8 16 50.3	10.313
14	12 12 9.10	2.2523	0 23 34.1	11.391	14	14 1 18.73	2.3073	8 27 7.9	10.268
15	12 14 24.25	2.2527	0 12 10.5	11.395	15	14 3 37.22	2.3090	8 37 22.4	10.215
16	12 16 39.42	2.2531	N. 0 0 46.7	11.398	16	14 5 55.81	2.3107	8 47 33.7	10.162
17	12 18 54.62	2.2536	S. 0 10 37.2	11.400	17	14 8 14.51	2.3125	8 57 41.8	10.107
18	12 21 9.85	2.2541	0 22 1.3	11.401	18	14 10 33.31	2.3142	9 7 46.5	10.051
19	12 23 25.11	2.2546	0 33 25.3	11.400	19	14 12 52.22	2.3160	9 17 47.9	9.994
20	12 25 40.40	2.2552	0 44 49.3	11.399	20	14 15 11.23	2.3178	9 27 45.8	9.937
21	12 27 55.73	2.2558	0 56 13.2	11.397	21	14 17 30.35	2.3196	9 37 40.3	9.878
22	12 30 11.09	2.2563	1 7 36.9	11.393	22	14 19 49.58	2.3214	9 47 31.1	9.817
23	12 32 26.49	2.2570	S. 1 19 0.3	11.388	23	14 22 8.92	2.3232	S. 9 57 18.3	9.756
FRIDAY 2.					SUNDAY 4.				
0	12 34 41.93	2.2578	S. 1 30 23.4	11.382	0	14 24 28.36	2.3249	S. 10 7 1.8	9.693
1	12 36 57.42	2.2585	1 41 46.1	11.374	1	14 26 47.91	2.3267	10 16 41.5	9.630
2	12 39 12.95	2.2593	1 53 8.3	11.365	2	14 29 7.57	2.3286	10 26 17.4	9.565
3	12 41 28.53	2.2601	2 4 29.9	11.355	3	14 31 27.34	2.3303	10 35 49.3	9.498
4	12 43 44.16	2.2609	2 15 50.9	11.345	4	14 33 47.21	2.3321	10 45 17.2	9.432
5	12 45 59.84	2.2618	2 27 11.3	11.333	5	14 36 7.19	2.3339	10 54 41.1	9.364
6	12 48 15.58	2.2628	2 38 30.9	11.319	6	14 38 27.28	2.3357	11 4 0.9	9.296
7	12 50 31.38	2.2637	2 49 49.6	11.304	7	14 40 47.47	2.3375	11 13 16.6	9.226
8	12 52 47.23	2.2647	3 1 7.4	11.289	8	14 43 7.78	2.3393	11 22 28.0	9.154
9	12 55 3.14	2.2657	3 12 24.3	11.272	9	14 45 28.19	2.3410	11 31 35.1	9.082
10	12 57 19.11	2.2668	3 23 40.1	11.254	10	14 47 48.70	2.3428	11 40 37.8	9.008
11	12 59 35.15	2.2679	3 34 54.8	11.235	11	14 50 9.32	2.3446	11 49 36.1	8.934
12	13 1 51.26	2.2691	3 46 8.3	11.214	12	14 52 30.05	2.3463	11 58 29.9	8.859
13	13 4 7.44	2.2702	3 57 20.5	11.193	13	14 54 50.88	2.3480	12 7 19.2	8.783
14	13 6 23.68	2.2713	4 8 31.4	11.170	14	14 57 11.81	2.3498	12 16 3.8	8.705
15	13 8 39.99	2.2725	4 19 40.9	11.146	15	14 59 32.85	2.3515	12 24 43.8	8.627
16	13 10 56.38	2.2738	4 30 48.9	11.121	16	15 1 53.99	2.3532	12 33 19.1	8.548
17	13 13 12.85	2.2751	4 41 55.4	11.094	17	15 4 15.23	2.3548	12 41 49.6	8.467
18	13 15 29.39	2.2763	4 53 0.2	11.067	18	15 6 36.57	2.3565	12 50 15.2	8.386
19	13 17 46.01	2.2777	5 4 3.4	11.038	19	15 8 58.01	2.3582	12 58 35.9	8.303
20	13 20 2.71	2.2790	5 15 4.8	11.008	20	15 11 19.55	2.3598	13 6 51.6	8.221
21	13 22 19.49	2.2804	5 26 4.3	10.977	21	15 13 41.18	2.3613	13 15 2.4	8.137
22	13 24 36.36	2.2818	5 37 2.0	10.945	22	15 16 2.91	2.3629	13 23 8.0	8.052
23	13 26 53.31	2.2833	5 47 57.7	10.911	23	15 18 24.73	2.3645	13 31 8.6	7.966
24	13 29 10.35	2.2848	S. 5 58 51.3	10.876	24	15 20 46.65	2.3661	S. 13 39 3.9	7.874

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 5.					WEDNESDAY 7.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	15 20 46.65	2.3661	S. 13 39 3.9	7.878	0	17 15 22.33	2.3894	S. 18 3 25.5	2.934
1	15 23 8.66	2.3675	13 46 54.0	7.791	1	17 17 45.67	2.3886	18 6 18.2	2.822
2	15 25 30.75	2.3690	13 54 38.8	7.703	2	17 20 8.96	2.3877	18 9 4.1	2.708
3	15 27 52.94	2.3705	14 2 18.3	7.613	3	17 22 32.19	2.3867	18 11 43.2	2.596
4	15 30 15.21	2.3718	14 9 52.4	7.523	4	17 24 55.36	2.3856	18 14 15.6	2.484
5	15 32 37.56	2.3732	14 17 21.0	7.432	5	17 27 18.46	2.3844	18 16 41.3	2.372
6	15 34 59.99	2.3746	14 24 44.2	7.340	6	17 29 41.49	2.3832	18 19 0.2	2.258
7	15 37 22.51	2.3759	14 32 1.8	7.247	7	17 32 4.45	2.3820	18 21 12.3	2.146
8	15 39 45.10	2.3772	14 39 13.8	7.153	8	17 34 27.33	2.3807	18 23 17.7	2.033
9	15 42 7.77	2.3785	14 46 20.1	7.058	9	17 36 50.13	2.3793	18 25 16.3	1.921
10	15 44 30.52	2.3797	14 53 20.8	6.964	10	17 39 12.85	2.3778	18 27 8.2	1.809
11	15 46 53.34	2.3808	15 0 15.8	6.868	11	17 41 35.47	2.3763	18 28 53.4	1.697
12	15 49 16.22	2.3819	15 7 4.9	6.770	12	17 43 58.00	2.3747	18 30 31.8	1.584
13	15 51 39.17	2.3831	15 13 48.2	6.673	13	17 46 20.43	2.3730	18 32 3.5	1.472
14	15 54 2.19	2.3842	15 20 25.7	6.576	14	17 48 42.76	2.3713	18 33 28.4	1.360
15	15 56 25.27	2.3852	15 26 57.3	6.477	15	17 51 4.99	2.3696	18 34 46.7	1.248
16	15 58 48.41	2.3862	15 33 22.9	6.377	16	17 53 27.11	2.3677	18 35 58.2	1.136
17	16 1 11.61	2.3871	15 39 42.5	6.277	17	17 55 49.11	2.3658	18 37 3.0	1.025
18	16 3 34.86	2.3879	15 45 56.1	6.177	18	17 58 11.00	2.3638	18 38 1.2	0.914
19	16 5 58.16	2.3888	15 52 3.7	6.075	19	18 0 32.77	2.3618	18 38 52.7	0.803
20	16 8 21.51	2.3896	15 58 5.1	5.973	20	18 2 54.41	2.3597	18 39 37.5	0.692
21	16 10 44.91	2.3903	16 4 0.4	5.870	21	18 5 15.93	2.3576	18 40 15.7	0.582
22	16 13 8.35	2.3910	16 9 49.5	5.767	22	18 7 37.32	2.3553	18 40 47.3	0.471
23	16 15 31.83	2.3917	S. 16 15 32.4	5.662	23	18 9 58.57	2.3531	S. 18 41 12.2	0.361
TUESDAY 6.					THURSDAY 8.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	16 17 55.35	2.3923	S. 16 21 9.0	5.558	0	18 12 19.69	2.3509	S. 18 41 30.6	0.252
1	16 20 18.90	2.3928	16 26 39.4	5.453	1	18 14 40.66	2.3483	18 41 42.4	0.142
2	16 22 42.49	2.3933	16 32 3.4	5.348	2	18 17 1.49	2.3459	18 41 47.6	- 0.032
3	16 25 6.10	2.3938	16 37 21.1	5.242	3	18 19 22.17	2.3434	18 41 46.2	+ 0.077
4	16 27 29.74	2.3942	16 42 32.4	5.136	4	18 21 42.70	2.3408	18 41 38.4	0.184
5	16 29 53.40	2.3945	16 47 37.4	5.029	5	18 24 3.07	2.3383	18 41 24.1	0.292
6	16 32 17.08	2.3947	16 52 35.9	4.921	6	18 26 23.29	2.3357	18 41 3.3	0.401
7	16 34 40.77	2.3949	16 57 27.9	4.813	7	18 28 43.35	2.3329	18 40 36.0	0.508
8	16 37 4.47	2.3951	17 2 13.5	4.706	8	18 31 3.24	2.3301	18 40 2.3	0.615
9	16 39 28.18	2.3952	17 6 52.6	4.598	9	18 33 22.96	2.3273	18 39 22.2	0.722
10	16 41 51.89	2.3953	17 11 25.2	4.488	10	18 35 42.51	2.3244	18 38 35.7	0.828
11	16 44 15.61	2.3953	17 15 51.2	4.378	11	18 38 1.89	2.3215	18 37 42.9	0.933
12	16 46 39.32	2.3952	17 20 10.6	4.269	12	18 40 21.09	2.3185	18 36 43.8	1.038
13	16 49 3.03	2.3950	17 24 23.5	4.159	13	18 42 40.11	2.3155	18 35 38.4	1.143
14	16 51 26.72	2.3948	17 28 29.7	4.048	14	18 44 58.95	2.3124	18 34 26.7	1.247
15	16 53 50.40	2.3946	17 32 29.3	3.938	15	18 47 17.60	2.3093	18 33 8.8	1.350
16	16 56 14.07	2.3942	17 36 22.3	3.828	16	18 49 36.07	2.3062	18 31 44.7	1.453
17	16 58 37.71	2.3938	17 40 8.7	3.717	17	18 51 54.34	2.3029	18 30 14.5	1.555
18	17 1 1.33	2.3935	17 43 48.3	3.605	18	18 54 12.42	2.2997	18 28 38.1	1.658
19	17 3 24.93	2.3930	17 47 21.3	3.494	19	18 56 30.31	2.2964	18 26 55.6	1.759
20	17 5 48.49	2.3923	17 50 47.6	3.382	20	18 58 47.99	2.2931	18 25 7.0	1.860
21	17 8 12.01	2.3917	17 54 7.1	3.270	21	19 1 5.48	2.2898	18 23 12.4	1.960
22	17 10 35.50	2.3911	17 57 20.0	3.158	22	19 3 22.76	2.2863	18 21 11.8	2.060
23	17 12 58.94	2.3903	18 0 26.1	3.046	23	19 5 39.83	2.2828	18 19 5.2	2.159
24	17 15 22.33	2.3894	S. 18 3 25.5	2.934	24	19 7 56.70	2.2794	S. 18 16 52.7	2.258

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 9.					SUNDAY 11.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	19 7 56.70	2.2794	S. 18 16 52.7	2.258	0	20 52 53.43	2.0898	S. 14 47 33.5	6.188
1	19 10 13.36	2.2758	18 14 34.3	2.356	1	20 54 58.70	2.0859	14 41 20.3	6.253
2	19 12 29.80	2.2723	18 12 10.0	2.453	2	20 57 3.74	2.0820	14 35 3.2	6.316
3	19 14 46.03	2.2687	18 9 39.9	2.550	3	20 59 8.54	2.0780	14 28 42.4	6.378
4	19 17 2.04	2.2650	18 7 4.0	2.647	4	21 1 13.10	2.0741	14 22 17.8	6.441
5	19 19 17.83	2.2613	18 4 22.3	2.743	5	21 3 17.43	2.0702	14 15 49.5	6.502
6	19 21 33.40	2.2577	18 1 34.9	2.838	6	21 5 21.53	2.0664	14 9 17.6	6.562
7	19 23 48.75	2.2539	17 58 41.8	2.932	7	21 7 25.40	2.0626	14 2 42.1	6.622
8	19 26 3.87	2.2502	17 55 43.1	3.025	8	21 9 29.04	2.0588	13 56 3.0	6.681
9	19 28 18.77	2.2464	17 52 38.8	3.118	9	21 11 32.45	2.0550	13 49 20.4	6.739
10	19 30 33.44	2.2426	17 49 28.9	3.211	10	21 13 35.64	2.0512	13 42 34.3	6.797
11	19 32 47.88	2.2388	17 46 13.5	3.304	11	21 15 38.60	2.0474	13 35 44.7	6.854
12	19 35 2.09	2.2349	17 42 52.7	3.393	12	21 17 41.33	2.0437	13 28 51.8	6.909
13	19 37 16.07	2.2310	17 39 26.4	3.483	13	21 19 43.84	2.0400	13 21 55.6	6.965
14	19 39 29.81	2.2271	17 35 54.7	3.573	14	21 21 46.13	2.0363	13 14 56.0	7.020
15	19 41 43.32	2.2232	17 32 17.7	3.662	15	21 23 48.20	2.0327	13 7 53.2	7.073
16	19 43 56.60	2.2193	17 28 35.3	3.750	16	21 25 50.05	2.0291	13 0 47.2	7.127
17	19 46 9.64	2.2153	17 24 47.7	3.837	17	21 27 51.69	2.0255	12 53 38.0	7.180
18	19 48 22.44	2.2113	17 20 54.8	3.924	18	21 29 53.11	2.0219	12 46 25.6	7.232
19	19 50 35.00	2.2073	17 16 56.8	4.010	19	21 31 54.32	2.0184	12 39 10.1	7.283
20	19 52 47.32	2.2033	17 12 53.6	4.096	20	21 33 55.32	2.0149	12 31 51.6	7.333
21	19 54 59.40	2.1993	17 8 45.3	4.180	21	21 35 56.11	2.0114	12 24 30.1	7.384
22	19 57 11.24	2.1953	17 4 32.0	4.264	22	21 37 56.69	2.0080	12 17 5.5	7.434
23	19 59 22.84	2.1913	S. 17 0 13.6	4.348	23	21 39 57.07	2.0046	S. 12 9 38.0	7.482
SATURDAY 10.					MONDAY 12.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	20 1 34.20	2.1873	S. 16 55 50.2	4.431	0	21 41 57.24	2.0012	S. 12 2 7.7	7.529
1	20 3 45.31	2.1832	16 51 21.9	4.512	1	21 43 57.21	1.9978	11 54 34.5	7.577
2	20 5 56.18	2.1791	16 46 48.8	4.593	2	21 45 56.98	1.9946	11 46 58.5	7.624
3	20 8 6.80	2.1750	16 42 10.8	4.673	3	21 47 56.56	1.9913	11 39 19.6	7.670
4	20 10 17.18	2.1710	16 37 28.0	4.753	4	21 49 55.94	1.9880	11 31 38.1	7.715
5	20 12 27.32	2.1669	16 32 40.5	4.832	5	21 51 55.12	1.9848	11 23 53.8	7.760
6	20 14 37.21	2.1628	16 27 48.2	4.910	6	21 53 54.11	1.9817	11 16 6.9	7.804
7	20 16 46.85	2.1587	16 22 51.3	4.987	7	21 55 52.92	1.9786	11 8 17.4	7.848
8	20 18 56.25	2.1546	16 17 49.8	5.063	8	21 57 51.54	1.9755	11 0 25.2	7.891
9	20 21 5.40	2.1505	16 12 43.7	5.139	9	21 59 49.98	1.9725	10 52 30.5	7.932
10	20 23 14.31	2.1464	16 7 33.1	5.214	10	22 1 48.24	1.9694	10 44 33.3	7.973
11	20 25 22.97	2.1423	16 2 18.0	5.289	11	22 3 46.31	1.9664	10 36 33.7	8.014
12	20 27 31.39	2.1382	15 56 58.4	5.363	12	22 5 44.21	1.9635	10 28 31.6	8.055
13	20 29 39.56	2.1342	15 51 34.5	5.435	13	22 7 41.93	1.9606	10 20 27.1	8.094
14	20 31 47.49	2.1302	15 46 6.2	5.507	14	22 9 39.48	1.9577	10 12 20.3	8.133
15	20 33 55.18	2.1261	15 40 33.6	5.579	15	22 11 36.86	1.9549	10 4 11.1	8.172
16	20 36 2.62	2.1220	15 34 56.7	5.650	16	22 13 34.07	1.9522	9 55 59.6	8.210
17	20 38 9.82	2.1179	15 29 15.6	5.720	17	22 15 31.12	1.9495	9 47 45.9	8.247
18	20 40 16.77	2.1138	15 23 30.3	5.789	18	22 17 28.01	1.9468	9 39 30.0	8.283
19	20 42 23.48	2.1098	15 17 40.9	5.857	19	22 19 24.73	1.9441	9 31 11.9	8.319
20	20 44 29.95	2.1058	15 11 47.4	5.925	20	22 21 21.30	1.9415	9 22 51.7	8.355
21	20 46 36.18	2.1018	15 5 49.9	5.992	21	22 23 17.71	1.9389	9 14 29.3	8.390
22	20 48 42.17	2.0978	14 59 48.4	6.058	22	22 25 13.97	1.9364	9 6 4.9	8.423
23	20 50 47.92	2.0938	14 53 42.9	6.124	23	22 27 10.08	1.9339	8 57 38.5	8.457
24	20 52 53.43	2.0898	S. 14 47 33.5	6.188	24	22 29 6.04	1.9314	S. 8 49 10.0	8.491



## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 13.					THURSDAY 15.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	22 29 6.04	1.9314	S. 8 49 10.0	8.491	0	23 59 53.52	1.8705	S. 1 34 1.2	9.439
1	22 31 1.85	1.9290	8 40 39.6	8.523	1	0 1 45.75	1.8704	1 24 34.6	9.447
2	22 32 57.52	1.9267	8 32 7.2	8.555	2	0 3 37.97	1.8704	1 15 7.6	9.453
3	22 34 53.05	1.9244	8 23 33.0	8.586	3	0 5 30.20	1.8705	1 5 40.2	9.459
4	22 36 48.45	1.9222	8 14 56.9	8.617	4	0 7 22.43	1.8706	0 56 12.5	9.464
5	22 38 43.71	1.9199	8 6 19.0	8.647	5	0 9 14.67	1.8708	0 46 44.5	9.469
6	22 40 38.84	1.9177	7 57 39.3	8.676	6	0 11 6.92	1.8710	0 37 16.2	9.474
7	22 42 33.84	1.9156	7 48 57.9	8.705	7	0 12 59.19	1.8713	0 27 47.6	9.479
8	22 44 28.71	1.9135	7 40 14.7	8.734	8	0 14 51.47	1.8716	0 18 18.7	9.483
9	22 46 23.46	1.9115	7 31 29.8	8.762	9	0 16 43.78	1.8720	S. 0 8 49.7	9.485
10	22 48 18.09	1.9095	7 22 43.3	8.789	10	0 18 36.11	1.8724	N. 0 0 39.5	9.488
11	22 50 12.60	1.9076	7 13 55.1	8.817	11	0 20 28.47	1.8729	0 10 8.8	9.490
12	22 52 7.00	1.9058	7 5 5.3	8.843	12	0 22 20.86	1.8734	0 19 38.3	9.492
13	22 54 1.29	1.9038	6 56 14.0	8.868	13	0 24 13.28	1.8740	0 29 7.8	9.493
14	22 55 55.46	1.9020	6 47 21.1	8.893	14	0 26 5.74	1.8747	0 38 37.4	9.493
15	22 57 49.53	1.9003	6 38 26.8	8.918	15	0 27 58.24	1.8753	0 48 7.0	9.493
16	22 59 43.50	1.8986	6 29 31.0	8.942	16	0 29 50.78	1.8761	0 57 36.6	9.492
17	23 1 37.36	1.8969	6 20 33.7	8.966	17	0 31 43.37	1.8768	1 7 6.1	9.491
18	23 3 31.13	1.8954	6 11 35.1	8.988	18	0 33 36.00	1.8777	1 16 35.5	9.489
19	23 5 24.81	1.8938	6 2 35.1	9.011	19	0 35 28.69	1.8786	1 26 4.8	9.488
20	23 7 18.39	1.8923	5 53 33.8	9.033	20	0 37 21.43	1.8795	1 35 34.0	9.486
21	23 9 11.88	1.8908	5 44 31.1	9.055	21	0 39 14.23	1.8805	1 45 3.1	9.483
22	23 11 5.29	1.8894	5 35 27.2	9.075	22	0 41 7.09	1.8816	1 54 31.9	9.478
23	23 12 58.61	1.8881	S. 5 26 22.1	9.096	23	0 43 0.02	1.8827	N. 2 4 0.5	9.474
WEDNESDAY 14.					FRIDAY 16.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	23 14 51.86	1.8868	S. 5 17 15.7	9.116	0	0 44 53.01	1.8838	N. 2 13 28.8	9.469
1	23 16 45.03	1.8855	5 8 8.2	9.135	1	0 46 46.07	1.8850	2 22 56.8	9.464
2	23 18 38.12	1.8843	4 58 59.5	9.154	2	0 48 39.21	1.8863	2 32 24.5	9.459
3	23 20 31.14	1.8832	4 49 49.7	9.172	3	0 50 32.42	1.8876	2 41 51.9	9.453
4	23 22 24.10	1.8821	4 40 38.9	9.189	4	0 52 25.72	1.8890	2 51 18.8	9.445
5	23 24 16.99	1.8809	4 31 27.0	9.207	5	0 54 19.10	1.8903	3 0 45.3	9.438
6	23 26 9.81	1.8799	4 22 14.0	9.224	6	0 56 12.56	1.8918	3 10 11.4	9.431
7	23 28 2.58	1.8790	4 13 0.1	9.240	7	0 58 6.11	1.8933	3 19 37.0	9.422
8	23 29 55.29	1.8781	4 3 45.2	9.256	8	0 59 59.75	1.8948	3 29 2.0	9.412
9	23 31 47.95	1.8772	3 54 29.4	9.271	9	1 1 53.49	1.8964	3 38 26.4	9.403
10	23 33 40.55	1.8763	3 45 12.7	9.286	10	1 3 47.32	1.8980	3 47 50.3	9.393
11	23 35 33.11	1.8757	3 35 55.1	9.301	11	1 5 41.25	1.8998	3 57 13.5	9.382
12	23 37 25.63	1.8750	3 26 36.6	9.314	12	1 7 35.29	1.9016	4 6 36.1	9.371
13	23 39 18.11	1.8743	3 17 17.4	9.327	13	1 9 29.44	1.9033	4 15 58.0	9.358
14	23 41 10.55	1.8737	3 7 57.4	9.340	14	1 11 23.69	1.9052	4 25 19.1	9.346
15	23 43 2.95	1.8731	2 58 36.6	9.352	15	1 13 18.06	1.9071	4 34 39.5	9.333
16	23 44 55.32	1.8726	2 49 15.1	9.363	16	1 15 12.54	1.9091	4 43 59.1	9.320
17	23 46 47.66	1.8722	2 39 53.0	9.374	17	1 17 7.15	1.9111	4 53 17.9	9.306
18	23 48 39.98	1.8718	2 30 30.2	9.386	18	1 19 1.87	1.9131	5 2 35.8	9.290
19	23 50 32.28	1.8715	2 21 6.7	9.396	19	1 20 56.72	1.9152	5 11 52.7	9.274
20	23 52 24.56	1.8712	2 11 42.7	9.405	20	1 22 51.69	1.9173	5 21 8.7	9.259
21	23 54 16.82	1.8708	2 2 18.1	9.414	21	1 24 46.80	1.9196	5 30 23.8	9.243
22	23 56 9.06	1.8706	1 52 53.0	9.423	22	1 26 42.04	1.9218	5 39 37.8	9.225
23	23 58 1.29	1.8705	1 43 27.3	9.432	23	1 28 37.41	1.9240	5 48 50.8	9.207
24	23 59 53.52	1.8705	S. 1 34 1.2	9.439	24	1 30 32.92	1.9264	N. 5 58 2.6	9.188

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 17.					MONDAY 19.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
1	1 30 32.92	1.9264	N. 5 58 2.6	9.188	1	3 6 31.91	2.0874	N. 12 45 9.3	7.496
2	1 32 28.58	1.9288	6 7 13.3	9.169	2	3 8 37.28	2.0915	12 52 37.4	7.442
3	1 34 24.38	1.9312	6 16 22.9	9.150	3	3 10 42.89	2.0957	13 0 2.3	7.387
4	1 36 20.32	1.9337	6 25 31.3	9.129	4	3 12 48.76	2.0999	13 7 23.9	7.332
5	1 38 16.42	1.9363	6 34 38.4	9.108	5	3 14 54.88	2.1041	13 14 42.1	7.275
6	1 40 12.67	1.9388	6 43 44.3	9.088	6	3 17 1.25	2.1083	13 21 56.9	7.218
7	1 42 9.08	1.9414	6 52 48.9	9.065	7	3 19 7.88	2.1126	13 29 8.3	7.160
8	1 44 5.64	1.9440	7 1 52.1	9.042	8	3 21 14.76	2.1168	13 36 16.1	7.101
9	1 46 2.36	1.9468	7 10 53.9	9.018	9	3 23 21.90	2.1212	13 43 20.4	7.041
10	1 47 59.25	1.9496	7 19 54.3	8.994	10	3 25 29.30	2.1255	13 50 21.0	6.980
11	1 49 56.31	1.9523	7 28 53.2	8.969	11	3 27 36.96	2.1298	13 57 18.0	6.919
12	1 51 53.53	1.9552	7 37 50.6	8.944	12	3 29 44.87	2.1341	14 4 11.3	6.857
13	1 53 50.93	1.9581	7 46 46.5	8.919	13	3 31 53.05	2.1385	14 11 0.8	6.793
14	1 55 48.50	1.9610	7 55 40.8	8.892	14	3 34 1.49	2.1428	14 17 46.4	6.728
15	1 57 46.25	1.9640	8 4 33.5	8.864	15	3 36 10.19	2.1472	14 24 28.2	6.664
16	1 59 44.18	1.9670	8 13 24.5	8.836	16	3 38 19.15	2.1515	14 31 6.1	6.598
17	2 1 42.29	1.9701	8 22 13.8	8.807	17	3 40 28.37	2.1558	14 37 40.0	6.531
18	2 3 40.59	1.9732	8 31 1.3	8.778	18	3 42 37.85	2.1602	14 44 9.8	6.463
19	2 5 39.08	1.9763	8 39 47.1	8.748	19	3 44 47.60	2.1647	14 50 35.6	6.395
20	2 7 37.75	1.9795	8 48 31.0	8.716	20	3 46 57.61	2.1690	14 56 57.2	6.326
21	2 9 36.62	1.9827	8 57 13.0	8.684	21	3 49 7.88	2.1734	15 3 14.7	6.256
22	2 11 35.68	1.9859	9 5 53.1	8.653	22	3 51 18.42	2.1779	15 9 27.9	6.184
23	2 13 34.93	1.9893	9 14 31.3	8.620	23	3 53 29.23	2.1823	15 15 36.8	6.112
24	2 15 34.39	1.9927	N. 9 23 7.5	8.586	24	3 55 40.29	2.1866	N. 15 21 41.4	6.040
SUNDAY 18.					TUESDAY 20.				
0	2 17 34.05	1.9960	N. 9 31 41.6	8.551	0	3 57 51.62	2.1911	N. 15 27 41.6	5.967
1	2 19 33.91	1.9994	9 40 13.6	8.516	1	4 0 3.22	2.1955	15 33 37.4	5.893
2	2 21 33.98	2.0029	9 48 43.5	8.480	2	4 2 15.08	2.1998	15 39 28.7	5.817
3	2 23 34.26	2.0064	9 57 11.2	8.443	3	4 4 27.20	2.2042	15 45 15.4	5.740
4	2 25 34.75	2.0099	10 5 36.7	8.406	4	4 6 39.58	2.2086	15 50 57.5	5.663
5	2 27 35.45	2.0135	10 13 59.9	8.368	5	4 8 52.23	2.2130	15 56 35.0	5.586
6	2 29 36.37	2.0171	10 22 20.8	8.329	6	4 11 5.14	2.2173	16 2 7.8	5.507
7	2 31 37.50	2.0208	10 30 39.4	8.290	7	4 13 18.31	2.2217	16 7 35.8	5.427
8	2 33 38.86	2.0244	10 38 55.6	8.249	8	4 15 31.74	2.2260	16 12 59.0	5.346
9	2 35 40.43	2.0281	10 47 9.3	8.208	9	4 17 45.43	2.2303	16 18 17.3	5.264
10	2 37 42.23	2.0318	10 55 20.5	8.165	10	4 19 59.38	2.2347	16 23 30.7	5.182
11	2 39 44.25	2.0356	11 3 29.1	8.123	11	4 22 13.59	2.2389	16 28 39.2	5.100
12	2 41 46.50	2.0394	11 11 35.2	8.079	12	4 24 28.05	2.2432	16 33 42.7	5.016
13	2 43 48.98	2.0433	11 19 38.6	8.035	13	4 26 42.77	2.2475	16 38 41.1	4.931
14	2 45 51.69	2.0471	11 27 39.4	7.990	14	4 28 57.75	2.2518	16 43 34.4	4.845
15	2 47 54.63	2.0510	11 35 37.4	7.944	15	4 31 12.98	2.2559	16 48 22.5	4.758
16	2 49 57.81	2.0550	11 43 32.7	7.898	16	4 33 28.46	2.2602	16 53 5.4	4.672
17	2 52 1.23	2.0589	11 51 25.2	7.851	17	4 35 44.20	2.2644	16 57 43.1	4.583
18	2 54 4.88	2.0629	11 59 14.8	7.802	18	4 38 0.19	2.2685	17 2 15.4	4.494
19	2 56 8.78	2.0670	12 7 1.4	7.753	19	4 40 16.42	2.2726	17 6 42.4	4.405
20	2 58 12.92	2.0710	12 14 45.1	7.703	20	4 42 32.90	2.2767	17 11 4.0	4.314
21	3 0 17.30	2.0750	12 22 25.8	7.653	21	4 44 49.63	2.2808	17 15 20.1	4.223
22	3 2 21.92	2.0791	12 30 3.4	7.601	22	4 47 6.60	2.2848	17 19 30.7	4.131
23	3 4 26.79	2.0833	12 37 37.9	7.549	23	4 49 23.81	2.2888	17 23 35.8	4.038
24	3 6 31.91	2.0874	N. 12 45 9.3	7.496	24	4 51 41.26	2.2928	N. 17 27 35.3	3.944

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 21.					FRIDAY 23.				
0	4 51 41.26	2.2928	N.17 27 35.3	3.944	0	6 45 25.90	2.4236	N.18 36 41.7	1.250
1	4 53 58.95	2.2968	17 31 29.1	3.850	1	6 47 51.35	2.4247	18 35 23.2	1.367
2	4 56 16.87	2.3007	17 35 17.3	3.755	2	6 50 16.86	2.4257	18 33 57.7	1.483
3	4 58 35.03	2.3046	17 38 59.7	3.658	3	6 52 42.43	2.4267	18 32 25.2	1.601
4	5 0 53.42	2.3084	17 42 36.3	3.562	4	6 55 8.06	2.4276	18 30 45.6	1.717
5	5 3 12.04	2.3122	17 46 7.1	3.464	5	6 57 33.74	2.4284	18 28 59.1	1.833
6	5 5 30.88	2.3159	17 49 32.0	3.366	6	6 59 59.47	2.4292	18 27 5.6	1.951
7	5 7 49.95	2.3197	17 52 51.0	3.267	7	7 2 25.24	2.4298	18 25 5.0	2.068
8	5 10 9.24	2.3233	17 56 4.1	3.168	8	7 4 51.05	2.4304	18 22 57.4	2.184
9	5 12 28.75	2.3270	17 59 11.2	3.068	9	7 7 16.89	2.4309	18 20 42.9	2.301
10	5 14 48.48	2.3306	18 2 12.2	2.967	10	7 9 42.76	2.4313	18 18 21.3	2.418
11	5 17 8.42	2.3341	18 5 7.2	2.865	11	7 12 8.65	2.4318	18 15 52.7	2.534
12	5 19 28.57	2.3376	18 7 56.0	2.763	12	7 14 34.57	2.4321	18 13 17.2	2.650
13	5 21 48.93	2.3411	18 10 38.7	2.660	13	7 17 0.50	2.4323	18 10 34.7	2.767
14	5 24 9.50	2.3445	18 13 15.2	2.556	14	7 19 26.45	2.4325	18 7 45.2	2.883
15	5 26 30.27	2.3478	18 15 45.4	2.452	15	7 21 52.40	2.4326	18 4 48.8	2.998
16	5 28 51.24	2.3511	18 18 9.4	2.347	16	7 24 18.36	2.4326	18 1 45.5	3.113
17	5 31 12.40	2.3543	18 20 27.0	2.242	17	7 26 44.31	2.4325	17 58 35.2	3.229
18	5 33 33.75	2.3575	18 22 38.4	2.136	18	7 29 10.26	2.4325	17 55 18.0	3.344
19	5 35 55.30	2.3607	18 24 43.3	2.028	19	7 31 36.21	2.4323	17 51 53.9	3.459
20	5 38 17.03	2.3638	18 26 41.8	1.922	20	7 34 2.14	2.4320	17 48 22.9	3.573
21	5 40 38.95	2.3668	18 28 33.9	1.813	21	7 36 28.05	2.4317	17 44 45.1	3.687
22	5 43 1.05	2.3698	18 30 19.4	1.705	22	7 38 53.94	2.4313	17 41 0.4	3.801
23	5 45 23.32	2.3726	N.18 31 58.5	1.597	23	7 41 19.80	2.4308	N.17 37 9.0	3.914
THURSDAY 22.					SATURDAY 24.				
0	5 47 45.76	2.3754	N.18 33 31.0	1.487	0	7 43 45.64	2.4303	N.17 33 10.7	4.027
1	5 50 8.37	2.3782	18 34 56.9	1.377	1	7 46 11.44	2.4298	17 29 5.7	4.140
2	5 52 31.15	2.3810	18 36 16.2	1.267	2	7 48 37.21	2.4292	17 24 53.9	4.253
3	5 54 54.09	2.3836	18 37 28.9	1.156	3	7 51 2.94	2.4284	17 20 35.4	4.364
4	5 57 17.18	2.3862	18 38 34.9	1.044	4	7 53 28.62	2.4276	17 16 10.2	4.475
5	5 59 40.43	2.3887	18 39 34.2	0.933	5	7 55 54.25	2.4268	17 11 38.4	4.586
6	6 2 3.83	2.3912	18 40 26.8	0.820	6	7 58 19.83	2.4259	17 6 59.9	4.697
7	6 4 27.37	2.3936	18 41 12.6	0.707	7	8 0 45.36	2.4250	17 2 14.8	4.806
8	6 6 51.06	2.3959	18 41 51.6	0.594	8	8 3 10.83	2.4239	16 57 23.2	4.915
9	6 9 14.88	2.3982	18 42 23.9	0.482	9	8 5 36.23	2.4228	16 52 25.0	5.025
10	6 11 38.84	2.4004	18 42 49.4	0.368	10	8 8 1.56	2.4217	16 47 20.2	5.133
11	6 14 2.93	2.4025	18 43 8.1	0.254	11	8 10 26.83	2.4206	16 42 9.0	5.240
12	6 16 27.14	2.4045	18 43 19.9	0.139	12	8 12 52.03	2.4193	16 36 51.4	5.347
13	6 18 51.47	2.4065	18 43 24.8	+ 0.024	13	8 15 17.15	2.4180	16 31 27.4	5.453
14	6 21 15.92	2.4085	18 43 22.8	- 0.090	14	8 17 42.19	2.4167	16 25 57.0	5.560
15	6 23 40.49	2.4103	18 43 14.0	0.205	15	8 20 7.15	2.4153	16 20 20.2	5.665
16	6 26 5.16	2.4120	18 42 58.2	0.321	16	8 22 32.03	2.4139	16 14 37.2	5.769
17	6 28 29.93	2.4137	18 42 35.5	0.436	17	8 24 56.82	2.4123	16 8 47.9	5.873
18	6 30 54.81	2.4154	18 42 5.9	0.552	18	8 27 21.51	2.4108	16 2 52.4	5.976
19	6 33 19.78	2.4169	18 41 29.3	0.668	19	8 29 46.12	2.4093	15 56 50.8	6.078
20	6 35 44.84	2.4183	18 40 45.7	0.784	20	8 32 10.63	2.4077	15 50 43.0	6.180
21	6 38 9.98	2.4198	18 39 55.2	0.900	21	8 34 35.04	2.4060	15 44 29.2	6.281
22	6 40 35.21	2.4212	18 38 57.7	1.017	22	8 36 59.35	2.4043	15 38 9.3	6.382
23	6 43 0.52	2.4224	18 37 53.2	1.133	23	8 39 23.55	2.4025	15 31 43.4	6.481
24	6 45 25.90	2.4236	N.18 36 41.7	1.250	24	8 41 47.65	2.4008	N.15 25 11.6	6.579

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 25.					TUESDAY 27.				
0	h m s	s	N. 15 25 11.6	6.579	0	h m s	s	N. 8 32 59.4	10.206
1	8 41 47.65	2.4008	15 18 33.9	6.678	1	10 34 33.12	2.2950	8 22 45.5	10.256
2	8 44 11.64	2.3989	15 11 50.3	6.775	2	10 36 50.76	2.2929	8 12 28.7	10.303
3	8 46 35.52	2.3971	15 5 0.9	6.871	3	10 39 8.27	2.2908	8 2 9.1	10.351
4	8 48 59.29	2.3952	14 58 5.8	6.966	4	10 41 25.66	2.2887	7 51 46.6	10.398
5	8 51 22.95	2.3933	14 51 5.0	7.061	5	10 43 42.92	2.2867	7 41 21.4	10.443
6	8 53 46.49	2.3913	14 43 58.5	7.155	6	10 46 0.06	2.2847	7 30 53.5	10.487
7	8 56 9.91	2.3893	14 36 46.4	7.248	7	10 48 17.08	2.2827	7 20 23.0	10.529
8	8 58 33.21	2.3873	14 29 28.8	7.339	8	10 50 33.98	2.2807	7 9 50.0	10.571
9	9 0 56.39	2.3853	14 22 5.7	7.431	9	10 52 50.77	2.2788	6 59 14.5	10.612
10	9 3 19.44	2.3832	14 14 37.1	7.522	10	10 55 7.44	2.2768	6 48 36.6	10.651
11	9 5 42.37	2.3811	14 7 3.1	7.611	11	10 57 23.99	2.2750	6 37 56.4	10.689
12	9 8 5.17	2.3789	13 59 23.8	7.699	12	10 59 40.44	2.2732	6 27 13.9	10.727
13	9 10 27.84	2.3768	13 51 39.2	7.787	13	11 1 56.77	2.2713	6 16 29.2	10.763
14	9 12 50.38	2.3746	13 43 49.4	7.873	14	11 4 12.99	2.2695	6 5 42.4	10.797
15	9 15 12.79	2.3724	13 35 54.4	7.959	15	11 6 29.11	2.2678	5 54 53.6	10.830
16	9 17 35.07	2.3702	13 27 54.3	8.044	16	11 8 45.12	2.2660	5 44 2.8	10.863
17	9 19 57.22	2.3680	13 19 49.1	8.128	17	11 11 1.03	2.2643	5 33 10.0	10.895
18	9 22 19.23	2.3658	13 11 39.0	8.210	18	11 13 16.84	2.2627	5 22 15.4	10.925
19	9 24 41.11	2.3635	13 3 23.9	8.292	19	11 15 32.55	2.2610	5 11 19.0	10.954
20	9 27 2.85	2.3612	12 55 4.0	8.373	20	11 17 48.16	2.2594	5 0 20.9	10.983
21	9 29 24.46	2.3589	12 46 39.2	8.453	21	11 20 3.68	2.2578	4 49 21.1	11.009
22	9 31 45.92	2.3566	12 38 9.6	8.532	22	11 22 19.10	2.2563	4 38 19.8	11.034
23	9 34 7.25	2.3544	12 29 35.4	8.608	23	11 24 34.44	2.2548	4 27 17.0	11.060
24	9 36 28.45	2.3521							
MONDAY 26.					WEDNESDAY 28.				
0	9 38 49.50	2.3497	N. 12 20 56.6	8.685	0	11 26 49.68	2.2533	N. 4 16 12.6	11.084
1	9 41 10.41	2.3474	12 12 13.2	8.761	1	11 29 4.84	2.2519	4 5 6.9	11.106
2	9 43 31.19	2.3451	12 3 25.3	8.836	2	11 31 19.91	2.2505	3 53 59.9	11.127
3	9 45 51.82	2.3427	11 54 32.9	8.910	3	11 33 34.90	2.2492	3 42 51.7	11.147
4	9 48 12.31	2.3403	11 45 36.1	8.982	4	11 35 49.81	2.2479	3 31 42.3	11.166
5	9 50 32.66	2.3381	11 36 35.0	9.053	5	11 38 4.65	2.2467	3 20 31.8	11.183
6	9 52 52.88	2.3357	11 27 29.7	9.123	6	11 40 19.41	2.2453	3 9 20.3	11.200
7	9 55 12.95	2.3333	11 18 20.2	9.193	7	11 42 34.09	2.2442	2 58 7.8	11.216
8	9 57 32.88	2.3310	11 9 6.5	9.262	8	11 44 48.71	2.2431	2 46 54.4	11.231
9	9 59 52.67	2.3288	10 59 48.8	9.328	9	11 47 3.26	2.2419	2 35 40.1	11.244
10	10 2 12.33	2.3264	10 50 27.1	9.395	10	11 49 17.74	2.2408	2 24 25.1	11.256
11	10 4 31.84	2.3241	10 41 1.4	9.460	11	11 51 32.15	2.2398	2 13 9.4	11.268
12	10 6 51.22	2.3218	10 31 31.9	9.523	12	11 53 46.51	2.2388	2 1 53.0	11.278
13	10 9 10.46	2.3195	10 21 58.6	9.587	13	11 56 0.81	2.2378	1 50 36.1	11.286
14	10 11 29.56	2.3172	10 12 21.5	9.649	14	11 58 15.05	2.2369	1 39 18.7	11.294
15	10 13 48.52	2.3148	10 2 40.7	9.710	15	12 0 29.24	2.2361	1 28 0.8	11.302
16	10 16 7.34	2.3126	9 52 56.3	9.769	16	12 2 43.38	2.2353	1 16 42.5	11.307
17	10 18 26.03	2.3103	9 43 8.4	9.827	17	12 4 57.47	2.2345	1 5 24.0	11.311
18	10 20 44.58	2.3081	9 33 17.0	9.885	18	12 7 11.52	2.2338	0 54 5.2	11.314
19	10 23 3.00	2.3059	9 23 22.2	9.941	19	12 9 25.52	2.2330	0 42 46.3	11.317
20	10 25 21.29	2.3037	9 13 24.1	9.996	20	12 11 39.48	2.2323	0 31 27.2	11.318
21	10 27 39.44	2.3014	9 3 22.7	10.051	21	12 13 53.40	2.2318	0 20 8.2	11.318
22	10 29 57.46	2.2993	8 53 18.0	10.104	22	12 16 7.29	2.2313	N. 0 8 49.1	11.317
23	10 32 15.36	2.2972	8 43 10.2	10.155	23	12 18 21.15	2.2307	S. 0 2 29.8	11.314
24	10 34 33.12	2.2950	N. 8 32 59.4	10.206	24	12 20 34.97	2.2301	S. 0 13 48.6	11.312
						12 22 48.76	2.2297		

GREENWICH MEAN TIME.

### THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.						
THURSDAY 29.							SATURDAY 31.												
0	h	m	s	s	°	'	0	h	m	s	s	°	'						
0	12	22	48.76	2.2297	S. 0	13 48.6	11.312	0	14	10	5.28	2.2540	S. 8 52 39.1	9.907					
1	12	25	2.53	2.2293	0	25 7.2	11.307	1	14	12	20.56	2.2553	9 2 31.9	9.853					
2	12	27	16.27	2.2289	0	36 25.5	11.302	2	14	14	35.92	2.2567	9 12 21.4	9.797					
3	12	29	30.00	2.2287	0	47 43.4	11.295	3	14	16	51.36	2.2580	9 22 7.5	9.740					
4	12	31	43.71	2.2283	0	59 0.9	11.287	4	14	19	6.88	2.2593	9 31 50.2	9.683					
5	12	33	57.40	2.2281	1	10 17.9	11.278	5	14	21	22.48	2.2607	9 41 29.5	9.626					
6	12	36	11.08	2.2278	1	21 34.3	11.268	6	14	23	38.16	2.2621	9 51 5.3	9.567					
7	12	38	24.74	2.2277	1	32 50.1	11.258	7	14	25	53.93	2.2635	10 0 37.5	9.507					
8	12	40	38.40	2.2277	1	44 5.2	11.246	8	14	28	9.78	2.2649	10 10 6.1	9.446					
9	12	42	52.06	2.2276	1	55 19.6	11.233	9	14	30	25.72	2.2664	10 19 31.0	9.383					
10	12	45	5.71	2.2275	2	6 33.2	11.219	10	14	32	41.75	2.2678	10 28 52.1	9.320					
11	12	47	19.36	2.2275	2	17 45.9	11.204	11	14	34	57.86	2.2693	10 38 9.4	9.257					
12	12	49	33.01	2.2276	2	28 57.7	11.188	12	14	37	14.06	2.2708	10 47 22.9	9.192					
13	12	51	46.67	2.2277	2	40 8.4	11.170	13	14	39	30.35	2.2723	10 56 32.4	9.126					
14	12	54	0.33	2.2278	2	51 18.1	11.152	14	14	41	46.73	2.2738	11 5 38.0	9.060					
15	12	56	14.01	2.2279	3	2 26.6	11.133	15	14	44	3.20	2.2753	11 14 39.6	8.992					
16	12	58	27.70	2.2282	3	13 34.0	11.112	16	14	46	19.77	2.2768	11 23 37.1	8.923					
17	13	0	41.40	2.2285	3	24 40.1	11.090	17	14	48	36.42	2.2783	11 32 30.4	8.854					
18	13	2	55.12	2.2288	3	35 44.8	11.067	18	14	50	53.17	2.2799	11 41 19.6	8.784					
19	13	5	8.85	2.2291	3	46 48.1	11.043	19	14	53	10.01	2.2814	11 50 4.5	8.713					
20	13	7	22.61	2.2295	3	57 50.0	11.019	20	14	55	26.94	2.2830	11 58 45.2	8.642					
21	13	9	36.39	2.2299	4	8 50.4	10.993	21	14	57	43.97	2.2846	12 7 21.5	8.568					
22	13	11	50.20	2.2303	4	19 49.2	10.967	22	15	0	1.09	2.2861	12 15 53.4	8.494					
23	13	14	4.03	2.2308	S. 4	30 46.4	10.938	23	15	2	18.30	2.2877	S. 12 24 20.8	8.420					
FRIDAY 30.							SUNDAY, JANUARY 1, 1905.												
0	13	16	17.90	2.2314	S. 4	41 41.8	10.909	0	15	4	35.61	2.2893	S. 12 32 43.8	8.345					
1	13	18	31.80	2.2319	4	52 35.5	10.879												
2	13	20	45.73	2.2325	5	3 27.3	10.848												
3	13	22	59.70	2.2332	5	14 17.2	10.816												
4	13	25	13.71	2.2338	5	25 5.2	10.783												
5	13	27	27.76	2.2346	5	35 51.2	10.749												
6	13	29	41.86	2.2353	5	46 35.1	10.713												
7	13	31	56.00	2.2361	5	57 16.8	10.677												
8	13	34	10.19	2.2369	6	7 56.3	10.640												
9	13	36	24.43	2.2378	6	18 33.6	10.602												
10	13	38	38.72	2.2387	6	29 8.5	10.563												
11	13	40	53.07	2.2396	6	39 41.1	10.523												
12	13	43	7.47	2.2405	6	50 11.2	10.481												
13	13	45	21.93	2.2415	7	0 38.8	10.438												
14	13	47	36.45	2.2425	7	11 3.8	10.395												
15	13	49	51.03	2.2435	7	21 26.2	10.351												
16	13	52	5.67	2.2446	7	31 45.9	10.305												
17	13	54	20.38	2.2457	7	42 2.8	10.258												
18	13	56	35.15	2.2468	7	52 16.9	10.211												
19	13	58	50.00	2.2480	8	2 28.1	10.163												
20	14	1	4.91	2.2491	8	12 36.4	10.113												
21	14	3	19.89	2.2503	8	22 41.7	10.063												
22	14	5	34.95	2.2516	8	32 44.0	10.012												
23	14	7	50.08	2.2528	8	42 43.1	9.959												
24	14	10	5.28	2.2540	S. 8	52 39.1	9.907												

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
1	Aldebaran W.	105 53 56	2274	107 40 34	2271	109 27 16	2268	111 14 3	2264
	Pollux W.	62 32 28	2368	64 16 48	2362	66 1 17	2357	67 45 54	2352
	Regulus W.	25 50 54	2285	27 37 16	2281	29 23 44	2276	31 10 19	2272
	SUN E.	74 32 15	2615	72 53 40	2611	71 15 0	2608	69 36 16	2605
2	Pollux W.	76 30 40	2332	78 15 53	2328	80 1 11	2326	81 46 32	2324
	Regulus W.	40 4 31	2257	41 51 34	2256	43 38 39	2253	45 25 47	2251
	SUN E.	61 21 45	2595	59 42 43	2595	58 3 41	2593	56 24 37	2593
3	Pollux W.	90 33 47	2321	92 19 16	2322	94 4 43	2323	95 50 9	2325
	Regulus W.	54 21 52	2249	56 9 7	2249	57 56 21	2250	59 43 34	2251
	SUN E.	48 9 20	2597	46 30 21	2600	44 51 26	2603	43 12 35	2606
4	Pollux W.	104 36 26	2341	106 21 26	2346	108 6 19	2351	109 51 4	2357
	Regulus W.	68 39 5	2262	70 26 0	2266	72 12 50	2269	73 59 35	2273
	SUN E.	34 59 49	2635	33 21 42	2643	31 43 46	2652	30 6 2	2664
9	SUN W.	29 24 45	3087	30 53 11	3096	32 21 25	3108	33 49 25	3119
	JUPITER E.	94 15 6	2659	92 37 31	2673	91 0 15	2687	89 23 18	2702
	α Arietis E.	109 2 21	2808	107 28 4	2821	105 54 3	2833	104 20 18	2846
10	SUN W.	41 5 52	3182	42 32 23	3194	43 58 39	3207	45 24 40	3220
	JUPITER E.	81 23 23	2774	79 48 21	2788	78 13 37	2801	76 39 11	2815
	α Arietis E.	96 35 38	2910	95 3 32	2924	93 31 44	2936	92 0 11	2949
11	SUN W.	52 30 53	3284	53 55 23	3296	55 19 39	3308	56 43 41	3319
	JUPITER E.	68 51 20	2880	67 18 36	2892	65 46 7	2904	64 13 53	2916
	α Arietis E.	84 26 37	3015	82 56 43	3029	81 27 6	3041	79 57 44	3054
	Aldebaran E.	117 4 0	2883	115 31 20	2896	113 58 56	2907	112 26 46	2919
12	SUN W.	63 40 35	3374	65 3 21	3384	66 25 56	3393	67 48 21	3401
	JUPITER E.	56 36 19	2969	55 5 28	2978	53 34 48	2988	52 4 20	2997
	α Arietis E.	72 34 49	3116	71 6 59	3129	69 39 24	3140	68 12 3	3151
	Aldebaran E.	104 49 27	2971	103 18 38	2980	101 48 0	2989	100 17 33	2997
13	SUN W.	74 38 3	3439	75 59 35	3446	77 20 59	3452	78 42 17	3457
	VENUS W.	35 40 20	3560	36 59 38	3563	38 18 53	3565	39 38 6	3566
	SATURN W.	18 59 18	3131	20 26 50	3129	21 54 24	3128	23 22 0	3126
	JUPITER E.	44 34 35	3034	43 5 5	3041	41 35 43	3047	40 6 28	3052
	α Arietis E.	60 58 45	3209	59 32 46	3220	58 7 1	3232	56 41 30	3243
	Aldebaran E.	92 47 49	3034	91 18 18	3039	89 48 54	3044	88 19 36	3050
14	SUN W.	85 27 31	3475	86 48 23	3478	88 9 12	3479	89 30 0	3480
	VENUS W.	46 13 40	3575	47 32 42	3574	48 51 45	3574	50 10 48	3574
	SATURN W.	30 40 10	3127	32 7 47	3127	33 35 24	3125	35 3 3	3125
	JUPITER E.	32 41 40	3072	31 12 56	3075	29 44 16	3077	28 15 38	3079
	α Arietis E.	49 37 18	3303	48 13 10	3316	46 49 17	3330	45 25 40	3345
	Aldebaran E.	80 54 30	3067	79 25 40	3069	77 56 53	3070	76 28 7	3072
15	SUN W.	96 13 52	3478	97 34 41	3475	98 55 33	3472	100 16 28	3470
	α Aquilæ W.	64 2 15	3643	65 20 3	3647	66 38 8	3648	67 56 29	3598
	VENUS W.	56 46 19	3565	58 5 32	3561	59 24 49	3557	60 44 10	3553

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
1	Aldebaran	W.	113 0 55	2261	114 47 52	2258	116 34 53	2256	118 21 58	2253
	Pollux	W.	69 30 38	2347	71 15 29	2342	73 0 27	2338	74 45 31	2335
	Regulus	W.	32 57 0	2268	34 43 46	2266	36 30 36	2262	38 17 31	2259
	SUN	E.	67 57 28	2603	66 18 37	2600	64 39 42	2599	63 0 45	2596
2	Pollux	W.	83 31 56	2323	85 17 22	2322	87 2 49	2321	88 48 18	2321
	Regulus	W.	47 12 58	2251	49 0 10	2250	50 47 23	2249	52 34 37	2249
	SUN	E.	54 45 32	2593	53 6 27	2594	51 27 24	2594	49 48 21	2596
3	Pollux	W.	97 35 32	2327	99 20 52	2330	101 6 8	2333	102 51 20	2337
	Regulus	W.	61 30 46	2253	63 17 55	2254	65 5 2	2257	66 52 5	2259
	SUN	E.	41 33 48	2610	39 55 7	2615	38 16 33	2621	36 38 7	2627
4	Pollux	W.	111 35 41	2364	113 20 8	2371	115 4 24	2379	116 48 29	2388
	Regulus	W.	75 46 14	2278	77 32 46	2283	79 19 11	2288	81 5 28	2294
	SUN	E.	28 28 34	2677	26 51 23	2692	25 14 33	2710	23 38 6	2728
9	SUN	W.	35 17 12	3131	36 44 44	3143	38 12 2	3155	39 39 5	3168
	JUPITER	E.	87 46 41	2716	86 10 23	2732	84 34 25	2745	82 58 45	2759
	α Arietis	E.	102 46 50	2858	101 13 37	2871	99 40 41	2883	98 8 1	2897
10	SUN	W.	46 50 25	3233	48 15 55	3247	49 41 9	3259	51 6 8	3271
	JUPITER	E.	75 5 2	2828	73 31 11	2842	71 57 38	2855	70 24 21	2867
	α Arietis	E.	90 28 54	2963	88 57 55	2977	87 27 13	2989	85 56 47	3002
11	SUN	W.	58 7 30	3332	59 31 5	3343	60 54 27	3353	62 17 37	3364
	JUPITER	E.	62 41 54	2927	61 10 10	2939	59 38 40	2949	58 7 23	2959
	α Arietis	E.	78 28 38	3067	76 59 48	3079	75 31 13	3092	74 2 54	3104
	Aldebaran	E.	110 54 51	2930	109 23 10	2941	107 51 43	2951	106 20 29	2961
12	SUN	W.	69 10 36	3410	70 32 41	3419	71 54 36	3426	73 16 23	3432
	JUPITER	E.	50 34 3	3005	49 3 57	3013	47 34 0	3021	46 4 13	3028
	α Arietis	E.	66 44 55	3163	65 18 2	3175	63 51 23	3186	62 24 57	3198
	Aldebaran	E.	98 47 17	3005	97 17 11	3014	95 47 15	3021	94 17 28	3027
13	SUN	W.	80 3 29	3462	81 24 36	3466	82 45 38	3470	84 6 36	3472
	VENUS	W.	40 57 17	3569	42 16 25	3571	43 35 31	3572	44 54 36	3573
	SATURN	W.	24 49 38	3126	26 17 16	3126	27 44 54	3126	29 12 32	3126
	JUPITER	E.	38 37 19	3057	37 8 17	3061	35 39 20	3065	34 10 28	3069
	α Arietis	E.	55 16 12	3255	53 51 8	3266	52 26 17	3278	51 1 40	3291
	Aldebaran	E.	86 50 25	3054	85 21 19	3059	83 52 19	3062	82 23 23	3065
14	SUN	W.	90 50 46	3480	92 11 32	3480	93 32 18	3480	94 53 4	3479
	VENUS	W.	51 29 51	3573	52 48 55	3571	54 8 1	3569	55 27 9	3567
	SATURN	W.	36 30 42	3124	37 58 22	3123	39 26 4	3121	40 53 48	3119
	JUPITER	E.	26 47 3	3081	25 18 30	3082	23 49 59	3083	22 21 29	3084
	α Arietis	E.	44 2 21	3361	42 39 20	3377	41 16 37	3394	39 54 14	3415
	Aldebaran	E.	74 59 23	3073	73 30 40	3072	72 1 56	3072	70 33 12	3070
15	SUN	W.	101 37 26	3466	102 58 28	3462	104 19 35	3457	105 40 47	3452
	α Aquilæ	W.	69 15 6	3584	70 33 58	3571	71 53 4	3557	73 12 25	3544
	VENUS	W.	62 3 36	3518	63 23 7	3544	64 42 43	3537	66 2 26	3531

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
15	SATURN W.	42 21 34	3117	43 59 23	3114	45 17 15	3110	46 45 12	3107
	Aldebaran E.	69 4 26	3069	67 35 39	3067	66 6 49	3065	64 37 56	3061
	Pollux E.	112 34 5	3155	111 7 2	3152	109 39 55	3148	108 12 43	3143
16	SUN W.	107 2 5	3446	108 23 30	3440	109 45 1	3434	111 6 39	3426
	α Aquilæ W.	74 32 1	3532	75 51 50	3521	77 11 51	3508	78 32 6	3496
	VENUS W.	67 22 16	3525	68 42 13	3517	70 2 18	3509	71 22 32	3502
	SATURN W.	54 6 11	3082	55 34 42	3076	57 3 21	3069	58 32 8	3063
	Aldebaran E.	57 12 24	3039	55 43 0	3034	54 13 30	3027	52 43 51	3021
	Pollux E.	100 55 17	3116	99 27 27	3110	97 59 30	3104	96 31 25	3096
17	SUN W.	117 57 1	3385	119 19 35	3376	120 42 19	3366	122 5 14	3356
	α Aquilæ W.	85 16 35	3441	86 38 5	3431	87 59 47	3420	89 21 41	3410
	VENUS W.	78 6 2	3455	79 27 16	3445	80 48 42	3434	82 10 20	3423
	SATURN W.	65 58 20	3022	67 28 6	3013	68 58 3	3002	70 28 13	2993
	Aldebaran E.	45 13 23	2981	43 42 47	2972	42 11 59	2962	40 40 59	2953
	Pollux E.	89 8 37	3056	87 39 33	3047	86 10 18	3038	84 40 52	3028
18	α Aquilæ W.	96 13 56	3364	97 36 54	3356	99 0 1	3348	100 23 17	3341
	VENUS W.	89 1 51	3361	90 24 52	3348	91 48 8	3335	93 11 39	3321
	SATURN W.	78 2 16	2938	79 33 47	2927	81 5 32	2914	82 37 33	2902
	Aldebaran E.	33 2 48	2899	31 30 28	2887	29 57 53	2876	28 25 3	2864
	Pollux E.	77 10 39	2977	75 39 58	2967	74 9 4	2957	72 37 57	2946
	Regulus E.	113 9 1	2901	111 36 43	2890	110 4 11	2877	108 31 23	2866
19	α Aquilæ W.	107 21 31	3313	108 45 28	3309	110 9 29	3306	111 33 33	3306
	VENUS W.	100 13 17	3250	101 38 27	3236	103 3 54	3220	104 29 39	3205
	SATURN W.	90 21 35	2838	91 55 14	2825	93 29 9	2811	95 3 22	2798
	JUPITER W.	27 40 17	2813	29 14 28	2798	30 48 58	2785	32 23 46	2770
	Pollux E.	64 58 55	2891	63 26 25	2880	61 53 41	2870	60 20 44	2860
	Regulus E.	100 43 24	2801	99 8 58	2788	97 34 15	2775	95 59 14	2762
20	VENUS W.	111 42 49	3131	113 10 21	3116	114 38 11	3101	116 6 20	3087
	SATURN W.	102 58 53	2730	104 34 53	2716	106 11 11	2703	107 47 47	2689
	JUPITER W.	40 22 22	2702	41 58 59	2688	43 35 55	2675	45 13 9	2660
	α Arietis W.	28 21 13	3312	29 45 11	3241	31 10 32	3177	32 37 9	3119
	Pollux E.	52 32 48	2813	50 58 37	2805	49 24 16	2798	47 49 45	2791
	Regulus E.	87 59 43	2694	86 22 55	2680	84 45 48	2666	83 8 23	2652
21	JUPITER W.	53 23 57	2593	55 3 1	2580	56 42 23	2568	58 22 2	2555
	α Arietis W.	40 5 39	2905	41 37 52	2871	43 10 48	2840	44 44 24	2811
	Regulus E.	74 56 42	2586	73 17 28	2573	71 37 56	2561	69 58 7	2548
	MARS E.	124 4 32	2769	122 29 23	2755	120 53 56	2741	119 18 10	2728
22	JUPITER W.	66 44 36	2494	68 25 57	2484	70 7 33	2472	71 49 25	2462
	α Arietis W.	52 41 1	2692	54 17 51	2672	55 55 8	2653	57 32 51	2635
	Aldebaran W.	18 33 30	2487	20 15 2	2475	21 56 50	2463	23 38 55	2453
	Regulus E.	61 34 41	2487	59 53 10	2476	58 11 23	2465	56 29 21	2454
	MARS E.	111 15 3	2665	109 37 36	2652	107 59 52	2640	106 21 52	2629
	Spica E.	115 6 56	2507	113 25 53	2496	111 44 34	2484	110 2 58	2472
23	JUPITER W.	80 22 25	2412	82 5 42	2403	83 49 12	2395	85 32 54	2387



## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XV <sup>h</sup>	P. L. of Diff.	XVIII <sup>h</sup>	P. L. of Diff.	XXI <sup>h</sup>	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
15	SATURN W.	48 13 13	3103	49 41 19	3099	51 9 30	3094	52 37 47	3088
	Aldebaran E.	63 8 59	3058	61 39 58	3055	60 10 53	3050	58 41 42	3044
	Pollux E.	106 45 25	3138	105 18 2	3134	103 50 34	3129	102 22 59	3123
16	SUN W.	112 28 26	3419	113 50 21	3411	115 12 25	3403	116 34 38	3394
	α Aquilæ W.	79 52 35	3485	81 13 16	3473	82 34 10	3463	83 55 16	3451
	VENUS W.	72 42 54	3493	74 3 26	3485	75 24 7	3475	76 44 59	3465
	SATURN W.	60 1 3	3056	61 30 7	3047	62 59 21	3039	64 28 45	3030
	Aldebaran E.	51 14 4	3014	49 44 8	3007	48 14 4	2998	46 43 49	2989
	Pollux E.	95 3 10	3089	93 34 47	3081	92 6 14	3073	90 37 31	3064
17	SUN W.	123 28 21	3345	124 51 40	3335	126 15 11	3324	127 38 55	3313
	α Aquilæ W.	90 43 46	3400	92 6 3	3391	93 28 30	3381	94 51 8	3372
	VENUS W.	83 32 11	3411	84 54 15	3399	86 16 33	3386	87 39 5	3374
	SATURN W.	71 58 35	2982	73 29 10	2972	74 59 58	2961	76 31 0	2950
	Aldebaran E.	39 9 47	2943	37 38 23	2932	36 6 45	2921	34 34 53	2911
	Pollux E.	83 11 14	3018	81 41 24	3009	80 11 22	2998	78 41 7	2988
18	α Aquilæ W.	101 46 41	3334	103 10 13	3327	104 33 53	3322	105 57 39	3317
	VENUS W.	94 35 26	3307	95 59 29	3294	97 23 48	3279	98 48 24	3265
	SATURN W.	84 9 49	2890	85 42 21	2877	87 15 9	2864	88 48 14	2852
	Aldebaran E.	26 51 58	2852	25 18 37	2839	23 45 0	2826	22 11 6	2814
	Pollux E.	71 6 36	2935	69 35 1	2924	68 3 13	2913	66 31 11	2902
	Regulus E.	106 58 20	2853	105 25 1	2840	103 51 25	2828	102 17 33	2815
19	α Aquilæ W.	112 57 38	3305	114 21 44	3296	115 45 48	3288	117 9 50	3272
	VENUS W.	105 55 42	3191	107 22 2	3177	108 48 39	3161	110 15 35	3146
	SATURN W.	96 37 53	2785	98 12 41	2771	99 47 47	2757	101 23 11	2744
	JUPITER W.	33 58 53	2756	35 34 18	2743	37 10 1	2729	38 46 2	2715
	Pollux E.	58 47 34	2850	57 14 11	2840	55 40 35	2831	54 6 47	2822
	Regulus E.	94 23 56	2748	92 48 20	2735	91 12 26	2721	89 36 14	2707
20	VENUS W.	117 34 46	3072	119 3 30	3058	120 32 31	3043	122 1 51	3028
	SATURN W.	109 24 41	2676	111 1 53	2663	112 39 23	2649	114 17 11	2636
	JUPITER W.	46 50 42	2647	48 28 33	2633	50 6 43	2620	51 45 11	2607
	α Arietis W.	34 4 56	3067	35 33 46	3022	37 3 32	2979	38 34 11	2940
	Pollux E.	46 15 5	2785	44 40 18	2781	43 5 25	2777	41 30 27	2775
	Regulus E.	81 30 39	2639	79 52 37	2626	78 14 17	2612	76 35 39	2599
21	JUPITER W.	60 1 59	2543	61 42 13	2530	63 22 44	2518	65 3 32	2507
	α Arietis W.	46 18 37	2785	47 53 25	2760	49 28 46	2736	51 4 38	2713
	Regulus E.	68 18 0	2535	66 37 35	2523	64 56 54	2511	63 15 56	2499
	MARS E.	117 42 7	2715	116 5 47	2701	114 29 9	2689	112 52 14	2677
22	JUPITER W.	73 31 32	2451	75 13 54	2441	76 56 30	2431	78 39 21	2422
	α Arietis W.	59 10 58	2619	60 49 27	2602	62 28 19	2587	64 7 32	2573
	Aldebaran W.	25 21 15	2441	27 3 51	2431	28 46 41	2421	30 29 46	2412
	Regulus E.	54 47 3	2444	53 4 31	2433	51 21 44	2424	49 38 43	2415
	MARS E.	104 43 37	2618	103 5 7	2608	101 26 23	2597	99 47 24	2587
	Spica E.	108 21 6	2462	106 38 59	2451	104 56 37	2441	103 14 1	2431
23	JUPITER W.	87 16 48	2379	89 0 53	2371	90 45 10	2364	92 29 37	2357

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
23	$\alpha$ Arietis W.	65 47 4	2559	67 26 55	2546	69 7 4	2534	70 47 30	2522
	Aldebaran W.	32 13 4	2402	33 56 36	2394	35 40 20	2384	37 24 17	2376
	Regulus E.	47 55 29	2405	46 12 2	2396	44 28 22	2387	42 44 29	2380
	MARS E.	98 8 11	2577	96 28 45	2568	94 49 6	2559	93 9 14	2550
	Spica E.	101 31 10	2422	99 48 6	2412	98 4 48	2403	96 21 18	2394
24	JUPITER W.	94 14 14	2350	95 59 0	2344	97 43 55	2338	99 28 59	2333
	$\alpha$ Arietis W.	79 13 20	2475	80 55 8	2467	82 37 7	2460	84 19 16	2454
	Aldebaran W.	46 6 55	2339	47 51 58	2333	49 37 9	2326	51 22 30	2321
	Regulus E.	34 2 22	2345	32 17 28	2339	30 32 25	2334	28 47 15	2328
	MARS E.	84 47 2	2512	83 6 5	2504	81 24 58	2499	79 43 43	2492
	Spica E.	87 40 54	2358	85 56 19	2351	84 11 34	2346	82 26 41	2340
25	$\alpha$ Arietis W.	92 52 0	2431	94 34 51	2428	96 17 46	2425	98 0 45	2424
	Aldebaran W.	60 11 6	2298	61 57 8	2294	63 43 16	2291	65 29 29	2288
	MARS E.	71 15 32	2469	69 33 35	2465	67 51 32	2461	66 9 24	2458
	Spica E.	73 40 28	2319	71 54 56	2315	70 9 19	2313	68 23 38	2310
	Antares E.	119 16 21	2377	117 32 13	2371	115 47 57	2366	114 3 33	2361
26	Aldebaran W.	74 21 30	2278	76 8 2	2277	77 54 36	2275	79 41 12	2274
	Pollux W.	32 2 0	2538	33 42 20	2515	35 23 13	2494	37 4 35	2476
	MARS E.	57 37 49	2448	55 55 22	2446	54 12 53	2445	52 30 23	2445
	Spica E.	59 34 30	2304	57 48 36	2303	56 2 41	2304	54 16 47	2304
	Antares E.	105 20 0	2344	103 35 4	2341	101 50 4	2339	100 5 2	2337
	SUN E.	131 23 37	2627	129 45 19	2625	128 6 58	2623	126 28 34	2621
27	Aldebaran W.	88 34 19	2274	90 20 56	2276	92 7 31	2277	93 54 5	2277
	Pollux W.	45 36 40	2417	47 19 50	2410	49 3 10	2403	50 46 40	2398
	MARS E.	43 57 46	2445	42 15 16	2447	40 32 48	2448	38 50 21	2448
	Spica E.	45 27 42	2313	43 42 2	2317	41 56 27	2321	40 10 58	2325
	Antares E.	91 19 30	2336	89 34 23	2337	87 49 18	2338	86 4 14	2339
	SUN E.	118 16 8	2617	116 37 36	2618	114 59 5	2618	113 20 34	2618
28	Aldebaran W.	102 46 30	2285	104 32 52	2287	106 19 10	2289	108 5 25	2291
	Pollux W.	59 25 36	2383	61 9 35	2382	62 53 35	2382	64 37 35	2382
	Regulus W.	22 42 27	2295	24 28 34	2296	26 14 39	2297	28 0 43	2299
	Antares E.	77 19 30	2350	75 34 43	2354	73 50 2	2357	72 5 25	2360
	SUN E.	105 8 19	2625	103 29 58	2627	101 51 40	2629	100 13 25	2631
29	Pollux W.	73 17 41	2384	75 1 38	2387	76 45 32	2388	78 29 24	2389
	Regulus W.	36 50 22	2309	38 36 8	2311	40 21 51	2314	42 7 30	2317
	Antares E.	63 23 48	2383	61 39 49	2389	59 55 58	2395	58 12 16	2401
	SUN E.	92 2 56	2645	90 25 2	2648	88 47 12	2651	87 9 26	2654
30	Pollux W.	87 7 51	2405	88 51 19	2408	90 34 42	2412	92 18 0	2417
	Regulus W.	50 54 36	2334	52 39 46	2337	54 24 51	2341	56 9 51	2344
	Antares E.	49 36 17	2441	47 53 41	2450	46 11 18	2462	44 29 11	2474
	SUN E.	79 1 48	2673	77 24 32	2678	75 47 22	2681	74 10 17	2685
31	Pollux W.	100 52 55	2440	102 35 33	2445	104 18 4	2450	106 0 27	2457
	Regulus W.	64 53 29	2364	66 37 55	2369	68 22 14	2373	70 6 27	2378
	SUN E.	66 6 20	2710	64 29 53	2714	62 53 32	2720	61 17 19	2725

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month	Name and Direction of Object		Midnight.	P. L. of Diff.	XV <sup>h</sup>	P. L. of Diff.	XVIII <sup>h</sup>	P. L. of Diff.	XXI <sup>h</sup>	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
23	α Arietis	W.	72 28 12	2512	74 9 8	2502	75 50 19	2492	77 31 43	2483
	Aldebaran	W.	39 8 26	2368	40 52 47	2360	42 37 19	2353	44 22 2	2346
	Regulus	E.	41 0 25	2372	39 16 10	2364	37 31 44	2357	35 47 8	2350
	MARS	E.	91 29 10	2541	89 48 54	2534	88 8 28	2525	86 27 50	2518
	Spica	E.	94 37 35	2387	92 53 41	2379	91 9 36	2371	89 25 20	2364
24	JUPITER	W.	101 14 11	2327	102 59 31	2323	104 44 57	2319	106 30 29	2314
	α Arietis	W.	86 1 34	2448	87 44 0	2443	89 26 34	2438	91 9 14	2434
	Aldebaran	W.	53 7 59	2316	54 53 35	2311	56 39 19	2307	58 25 9	2302
	Regulus	E.	27 1 57	2324	25 16 33	2321	23 31 4	2318	21 45 31	2316
	MARS	E.	78 2 19	2487	76 20 48	2482	74 39 9	2477	72 57 24	2472
	Spica	E.	80 41 40	2335	78 56 32	2331	77 11 17	2326	75 25 55	2322
25	α Arietis	W.	99 43 46	2422	101 26 49	2422	103 9 52	2422	104 52 55	2422
	Aldebaran	W.	67 15 46	2285	69 2 7	2283	70 48 32	2281	72 35 0	2279
	MARS	E.	64 27 12	2455	62 44 56	2453	61 2 37	2450	59 20 14	2449
	Spica	E.	66 37 53	2309	64 52 6	2307	63 6 16	2305	61 20 24	2304
	Antares	E.	112 19 2	2356	110 34 24	2353	108 49 41	2349	107 4 53	2346
26	Aldebaran	W.	81 27 49	2274	83 14 26	2274	85 1 4	2274	86 47 42	2274
	Pollux	W.	38 46 22	2460	40 28 31	2447	42 10 59	2436	43 53 43	2426
	MARS	E.	50 47 52	2445	49 5 21	2444	47 22 49	2444	45 40 17	2445
	Spica	E.	52 30 53	2305	50 45 1	2307	48 59 12	2309	47 13 25	2311
	Antares	E.	98 19 57	2337	96 34 51	2337	94 49 45	2336	93 4 38	2335
	SUN	E.	124 50 8	2620	123 11 40	2618	121 33 10	2618	119 54 39	2618
27	Aldebaran	W.	95 40 38	2279	97 27 9	2280	99 13 38	2281	101 0 5	2283
	Pollux	W.	52 30 17	2394	54 14 0	2391	55 57 48	2388	57 41 40	2385
	MARS	E.	37 7 55	2450	35 25 32	2453	33 43 12	2455	32 0 55	2456
	Spica	E.	38 25 35	2331	36 40 20	2336	34 55 13	2343	33 10 16	2351
	Antares	E.	84 19 12	2341	82 34 12	2343	80 49 15	2345	79 4 21	2347
	SUN	E.	111 42 4	2619	110 3 35	2621	108 25 8	2621	106 46 42	2624
28	Aldebaran	W.	109 51 37	2294	111 37 45	2296	113 23 50	2299	115 9 51	2301
	Pollux	W.	66 21 36	2382	68 5 37	2381	69 49 39	2381	71 33 41	2382
	Regulus	W.	29 46 44	2300	31 32 43	2302	33 18 39	2304	35 4 32	2307
	Antares	E.	70 20 53	2364	68 36 27	2368	66 52 7	2373	65 7 54	2378
	SUN	E.	98 35 12	2634	96 57 3	2636	95 18 57	2639	93 40 55	2641
29	Pollux	W.	80 13 14	2392	81 57 0	2395	83 40 41	2398	85 24 18	2401
	Regulus	W.	43 53 4	2320	45 38 34	2324	47 23 59	2326	49 9 20	2330
	Antares	E.	56 28 43	2408	54 45 20	2415	53 2 7	2424	51 19 6	2432
	SUN	E.	85 31 44	2658	83 54 8	2661	82 16 36	2665	80 39 9	2669
30	Pollux	W.	94 1 11	2420	95 44 17	2425	97 27 16	2429	99 10 9	2434
	Regulus	W.	57 54 46	2348	59 39 35	2352	61 24 19	2356	63 8 57	2360
	Antares	E.	42 47 21	2487	41 5 49	2501	39 24 37	2517	37 43 47	2533
	SUN	E.	72 33 17	2689	70 56 23	2695	69 19 36	2699	67 42 55	2704
31	Pollux	W.	107 42 41	2463	109 24 46	2470	111 6 41	2477	112 48 27	2482
	Regulus	W.	71 50 34	2382	73 34 34	2387	75 18 27	2392	77 2 13	2398
	SUN	E.	59 41 12	2730	58 5 12	2736	56 29 20	2741	54 53 35	2747

## GREENWICH MEAN TIME.

JANUARY.						FEBRUARY.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	20 6 8.60	+ 10.165	- 21 25 53.1	+ 58.36	1 27.3	1	19 15 42.41	+ 4.503	- 20 7 29.7	- 19.69	22 32.7
2	20 9 59.09	9.021	21 2 28.0	58.62	1 27.1	2	19 17 42.81	5.516	20 15 0.5	17.85	22 31.2
3	20 13 20.48	7.738	20 39 4.5	58.20	1 26.5	3	19 20 6.49	6.443	20 21 45.0	15.82	22 30.0
4	20 16 9.38	6.313	20 15 59.8	57.04	1 25.4	4	19 22 51.43	7.289	20 27 39.0	13.65	22 29.1
5	20 18 22.35	4.744	19 53 32.8	55.06	1 23.6	5	19 25 55.77	8.060	20 32 39.3	11.35	22 28.5
6	20 19 55.97	+ 3.035	- 19 32 3.3	+ 52.24	1 21.2	6	19 29 17.78	+ 8.762	- 20 36 42.7	- 8.94	22 28.2
7	20 20 47.03	+ 1.200	19 11 51.8	48.57	1 18.1	7	19 32 55.87	9.402	20 39 46.3	6.37	22 28.1
8	20 20 52.76	- 0.739	18 53 18.4	44.07	1 14.2	8	19 36 48.63	9.985	20 41 47.7	3.72	22 28.2
9	20 20 11.05	2.746	18 36 42.2	38.82	1 9.5	9	19 40 54.70	10.513	20 42 44.9	- 1.01	22 28.6
10	20 18 40.82	4.773	18 22 20.0	32.93	1 4.0	10	19 45 12.88	10.994	20 42 35.8	+ 1.78	22 29.1
11	20 16 22.24	- 6.767	- 18 10 25.1	+ 26.57	0 57.8	11	19 49 42.09	+ 11.433	- 20 41 18.8	+ 4.65	22 29.8
12	20 13 17.14	8.638	18 1 6.6	19.94	0 50.8	12	19 54 21.36	11.833	20 38 52.3	7.57	22 30.7
13	20 9 29.13	10.325	17 54 28.5	13.25	0 43.1	13	19 59 9.79	12.197	20 35 15.1	10.54	22 31.7
14	20 5 3.65	11.746	17 50 29.3	6.74	0 34.7	14	20 4 6.56	12.529	20 30 26.1	13.55	22 32.8
15	20 0 7.98	12.831	17 49 2.0	+ 0.61	0 25.9	15	20 9 10.96	12.833	20 24 24.3	16.61	22 34.1
16	19 54 50.84	- 13.528	- 17 49 55.5	- 4.96	0 16.7	16	20 14 22.32	+ 13.110	- 20 17 8.7	+ 19.70	22 35.4
17	19 49 21.94	13.809	17 52 55.1	9.88	$\left\{ \begin{smallmatrix} 0 & 7.4 \\ 23 & 54.0 \end{smallmatrix} \right.$	17	20 19 40.05	13.363	20 8 38.7	22.81	22 36.8
18	19 43 51.32	13.673	17 57 44.1	14.08	23 48.7	18	20 25 3.60	13.596	19 58 53.7	25.95	22 38.4
19	19 38 28.72	13.147	18 4 5.3	17.56	23 39.7	19	20 30 32.49	13.809	19 47 53.0	29.11	22 40.0
20	19 33 23.01	12.276	18 11 41.6	20.36	23 31.1	20	20 36 6.28	14.005	19 35 36.3	32.29	22 41.7
21	19 28 41.69	- 11.126	- 18 20 17.7	- 22.54	23 23.0	21	20 41 44.58	+ 14.185	- 19 22 3.2	+ 35.48	22 43.4
22	19 24 30.66	9.764	18 29 38.9	24.14	23 15.5	22	20 47 27.03	14.351	19 7 13.3	38.68	22 45.3
23	19 20 54.13	8.261	18 39 32.6	25.26	23 8.6	23	20 53 13.31	14.504	18 51 6.4	41.91	22 47.2
24	19 17 54.73	6.680	18 49 47.9	25.94	23 2.3	24	20 59 3.13	14.646	18 33 42.3	45.11	22 49.1
25	19 15 33.68	5.074	19 0 14.3	26.21	22 56.6	25	21 4 56.25	14.779	18 15 0.9	48.34	22 51.1
26	19 13 51.04	- 3.485	- 19 10 42.9	- 26.12	22 51.6	26	21 10 52.43	+ 14.902	- 17 55 1.9	+ 51.57	22 53.1
27	19 12 46.01	1.945	19 21 5.4	25.71	22 47.1	27	21 16 51.49	15.018	17 33 45.4	54.80	22 55.2
28	19 12 17.12	- 0.476	19 31 14.7	25.01	22 43.3	28	21 22 53.24	15.127	17 11 11.3	58.04	22 57.4
29	19 12 22.50	+ 0.909	19 41 3.7	24.03	22 39.9	29	21 28 57.55	15.231	16 47 19.5	61.28	22 59.5
30	19 13 0.01	2.201	19 50 26.3	22.81	22 37.1	30	21 35 4.29	15.330	16 22 10.1	64.52	23 1.7
31	19 14 7.40	+ 3.399	- 19 59 16.7	- 21.35	22 34.7	31	21 41 13.35	+ 15.425	- 15 55 43.1	+ 67.74	23 4.0
32	19 15 42.41	+ 4.503	- 20 7 29.7	- 19.69	22 32.7	32	21 47 24.65	+ 15.516	- 15 27 58.6	+ 70.97	23 6.3
Day of the Month.						Day of the Month.					
0 5th. 10th. 15th. 20th. 25th. 30th.						4th. 9th. 14th. 19th. 24th. 29th.					
Semidiameter.						Semidiameter					
Hor. Parallax.						Hor. Parallax					

NOTE.—The sign + indicates north declinations; the sign - indicates south declinations.

## GREENWICH MEAN TIME.

MARCH.						APRIL.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	21 35 4.29	+ 15.330	16 22 10.1	+ 64.52	23 1.7	1	1 4 12.97	+ 18.484	6 28 47.1	+ 142.22	0 26.6
2	21 41 13.35	15.425	15 55 43.1	67.74	23 4.0	2	1 11 36.83	18.499	7 25 33.9	141.60	0 30.1
3	21 47 24.65	15.516	15 27 58.6	70.97	23 6.3	3	1 19 0.64	18.479	8 21 59.8	140.47	0 33.5
4	21 53 38.12	15.606	14 58 56.7	74.19	23 8.6	4	1 26 23.53	18.422	9 17 52.2	138.80	0 37.0
5	21 59 53.72	15.694	14 28 37.4	77.41	23 11.0	5	1 33 44.55	18.321	10 12 58.0	136.59	0 40.4
6	22 6 11.41	+ 15.780	13 57 1.1	+ 80.62	23 13.3	6	1 41 2.59	+ 18.174	11 7 3.9	+ 133.80	0 43.7
7	22 12 31.17	15.866	13 24 7.8	83.82	23 15.8	7	1 48 16.52	17.978	11 59 56.2	130.47	0 47.0
8	22 18 53.01	15.953	12 49 57.8	87.01	23 18.2	8	1 55 25.11	17.729	12 51 22.0	126.59	0 50.3
9	22 25 16.94	16.041	12 14 31.3	90.19	23 20.7	9	2 2 27.09	17.427	13 41 8.6	122.21	0 53.4
10	22 31 42.97	16.129	11 37 48.7	93.35	23 23.2	10	2 9 21.16	17.070	14 29 4.3	117.37	0 56.3
11	22 38 11.16	+ 16.220	10 59 50.4	+ 96.50	23 25.8	11	2 16 6.05	+ 16.661	15 14 58.5	+ 112.09	0 59.1
12	22 44 41.55	16.313	10 20 36.8	99.64	23 28.4	12	2 22 40.49	16.200	15 58 41.7	106.46	1 1.7
13	22 51 14.21	16.409	9 40 8.2	102.74	23 31.1	13	2 29 3.26	15.689	16 40 6.0	100.52	1 4.2
14	22 57 49.20	16.508	8 58 25.5	105.81	23 33.8	14	2 35 13.20	15.131	17 19 4.6	94.32	1 6.4
15	23 4 26.61	16.610	8 15 29.3	108.86	23 36.5	15	2 41 9.21	14.529	17 55 32.1	87.94	1 8.4
16	23 11 6.53	+ 16.717	7 31 20.5	+ 111.87	23 39.3	16	2 46 50.25	+ 13.884	18 29 24.4	+ 81.40	1 10.1
17	23 17 49.06	16.828	6 46 0.0	114.83	23 42.1	17	2 52 15.35	13.201	19 0 38.4	74.75	1 11.6
18	23 24 34.29	16.942	5 59 29.1	117.73	23 44.9	18	2 57 23.63	12.482	19 29 12.0	68.04	1 12.8
19	23 31 22.31	17.060	5 11 49.3	120.57	23 47.8	19	3 2 14.24	11.730	19 55 4.1	61.30	1 13.6
20	23 38 13.22	17.182	4 23 2.1	123.34	23 50.8	20	3 6 46.42	10.547	20 18 14.1	54.53	1 14.2
21	23 45 7.10	+ 17.308	3 33 9.8	+ 126.01	23 53.8	21	3 10 59.47	+ 10.136	20 38 41.7	+ 47.77	1 14.5
22	23 52 4.03	17.436	2 42 14.5	128.57	23 56.9	22	3 14 52.74	9.299	20 56 27.3	41.03	1 14.4
23	23 59 4.06	17.566	1 50 19.3	131.00	23 59.9	23	3 18 25.65	8.440	21 11 31.4	34.32	1 14.0
24	0 6 7.20	17.696	0 57 27.6	133.28	0 0.0	24	3 21 37.69	7.560	21 23 54.8	27.64	1 13.2
25	0 13 13.47	17.826	0 3 43.3	135.38	0 3.2	25	3 24 28.41	6.664	21 33 38.3	21.00	1 12.1
26	0 20 22.82	+ 17.953	0 50 49.0	+ 137.27	0 6.4	26	3 26 57.47	+ 5.755	21 40 42.9	+ 14.40	1 10.7
27	0 27 35.14	18.073	1 46 4.0	138.93	0 9.7	27	3 29 4.59	4.837	21 45 9.7	7.84	1 8.8
28	0 34 50.28	18.186	2 41 55.3	140.30	0 13.0	28	3 30 49.63	3.916	21 47 0.0	+ 1.35	1 6.6
29	0 42 8.00	18.288	3 38 15.8	141.36	0 16.3	29	3 32 12.56	2.996	21 46 15.2	- 5.07	1 4.0
30	0 49 27.98	18.372	4 34 57.5	142.06	0 19.7	30	3 33 13.50	2.084	21 42 57.4	11.40	1 1.1
31	0 56 49.81	+ 18.442	5 31 51.3	+ 142.36	0 23.2	31	3 33 52.73	+ 1.189	21 37 8.8	- 17.62	0 57.8
32	1 4 12.97	+ 18.484	6 28 47.1	+ 142.22	0 26.6	32	3 34 10.73	+ 0.316	21 28 52.6	- 23.70	0 54.2

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.	Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
Semidiameter	2.60	2.53	2.48	2.46	2.47	2.53	Semidiameter	2.66	2.88	3.20	3.64	4.18	4.78
Hor. Parallax	6.86	6.67	6.54	6.49	6.52	6.67	Hor. Parallax	7.01	7.58	8.44	9.60	11.01	12.60

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign - indicates that north declinations are decreasing or south declinations increasing.

## GREENWICH MEAN TIME.

MAY.						JUNE.							
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.		
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.			
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m		
1	3 33 52.73	+ 1.189	+ 21 37 8.8	- 17.62	0 57.8	1	3 9 50.50	+ 4.609	+ 13 43 6.2	+ 16.58	22 29.8		
2	3 34 10.73	+ 0.316	21 28 52.6	23.70	0 54.2	2	3 11 49.03	5.267	13 50 43.6	21.50	22 28.1		
3	3 34 8.14	- 0.525	21 18 12.6	29.60	0 50.2	3	3 14 3.23	5.915	14 0 16.4	26.19	22 26.7		
4	3 33 45.86	1.324	21 5 13.8	35.26	0 45.9	4	3 16 32.90	6.555	14 11 38.8	30.64	22 25.4		
5	3 33 4.97	2.073	20 50 2.4	40.64	0 41.2	5	3 19 17.81	7.186	14 24 44.9	34.83	22 24.5		
6	3 32 6.82	- 2.762	+ 20 32 46.0	- 45.67	0 36.3	6	3 22 17.76	+ 7.809	+ 14 39 28.6	+ 38.76	22 23.8		
7	3 30 52.94	3.381	20 13 33.8	50.27	0 31.2	7	3 25 32.59	8.425	14 55 43.5	42.42	22 23.3		
8	3 29 25.15	3.922	19 52 36.9	54.38	0 25.8	8	3 29 2.12	9.035	15 13 23.2	45.83	22 23.1		
9	3 27 45.37	4.378	19 30 8.0	57.93	0 20.2	9	3 32 46.22	9.640	15 32 21.4	48.96	22 23.1		
10	3 25 55.76	4.741	19 6 21.5	60.84	0 14.5	10	3 36 44.81	10.242	15 52 31.4	51.81	22 23.4		
11	3 23 58.59	- 5.007	+ 18 41 33.3	- 63.04	0 8.6	11	3 40 57.82	+ 10.842	+ 16 13 46.2	+ 54.38	22 23.9		
12	3 21 56.21	5.174	18 16 0.9	64.52	0 2.1	12	3 45 25.20	11.440	16 35 59.3	56.66	22 24.6		
13	3 19 51.02	5.241	17 50 2.6	65.21	23 50.6	13	3 50 6.95	12.039	16 59 3.7	58.65	22 25.6		
14	3 17 45.44	5.209	17 23 57.4	65.09	23 44.6	14	3 55 3.09	12.640	17 22 52.3	60.34	22 26.8		
15	3 15 41.76	5.082	16 58 4.5	64.17	23 38.7	15	4 0 13.67	13.242	17 47 17.7	61.72	22 28.2		
16	3 13 42.23	- 4.864	+ 16 32 42.9	- 62.48	23 32.9	16	4 5 38.75	+ 13.849	+ 18 12 12.4	+ 62.78	22 29.9		
17	3 11 48.94	4.563	16 8 10.9	60.09	23 27.2	17	4 11 18.44	14.459	18 37 28.5	63.51	22 31.9		
18	3 10 3.81	4.186	15 44 45.5	56.94	23 21.7	18	4 17 12.83	15.071	19 2 57.9	63.89	22 34.1		
19	3 8 28.57	3.741	15 22 42.5	53.21	23 16.4	19	4 23 22.03	15.693	19 28 32.1	63.90	22 36.5		
20	3 7 4.71	3.238	15 2 15.8	48.94	23 11.3	20	4 29 46.14	16.316	19 54 2.0	63.53	22 39.2		
21	3 5 53.54	- 2.686	+ 14 43 37.3	- 44.20	23 6.4	21	4 36 25.22	+ 16.941	+ 20 19 18.3	+ 62.76	22 42.2		
22	3 4 56.13	2.092	14 26 57.2	39.09	23 1.7	22	4 43 19.34	17.568	20 44 11.1	61.56	22 45.4		
23	3 4 13.37	1.466	14 12 23.2	33.70	22 57.3	23	4 50 28.47	18.192	21 8 29.9	59.92	22 48.9		
24	3 3 45.94	0.816	14 0 1.3	28.10	22 53.2	24	4 57 52.54	18.812	21 32 3.8	57.83	22 52.6		
25	3 3 34.32	- 0.149	13 49 55.5	22.36	22 49.3	25	5 5 31.38	19.421	21 54 41.7	55.25	22 56.5		
26	3 3 38.86	+ 0.529	+ 13 42 8.3	- 16.57	22 45.7	26	5 13 24.70	+ 20.018	+ 22 16 11.6	+ 52.17	23 0.7		
27	3 3 59.78	1.215	13 36 40.2	10.78	22 42.4	27	5 21 32.09	20.594	22 36 21.7	48.59	23 5.1		
28	3 4 37.18	1.902	13 33 30.6	- 5.03	22 39.4	28	5 29 53.00	21.143	22 54 59.7	44.49	23 9.7		
29	3 5 31.05	2.587	13 32 37.8	+ 0.61	22 36.6	29	5 38 26.67	21.657	23 11 53.6	39.91	23 14.6		
30	3 6 41.32	3.268	13 33 58.7	6.11	22 34.1	30	5 47 12.21	22.130	23 26 51.6	34.84	23 19.6		
31	3 8 7.86	+ 3.942	+ 13 37 29.6	+ 11.44	22 31.8	31	5 56 8.52	+ 22.554	+ 23 39 42.4	+ 29.32	23 24.7		
32	3 9 50.50	+ 4.609	+ 13 43 6.2	+ 16.58	22 29.8	32	6 5 14.35	+ 22.921	+ 23 50 15.7	+ 23.39	23 30.0		
Day of the Month.						Day of the Month.							
	4th.	9th.	14th.	19th.	24th.	29th.		3d.	8th.	13th.	18th.	23d.	28th.
Semidiameter . . .	5.37	5.84	6.03	5.93	5.58	5.09	Semidiameter . . .	4.58	4.10	3.66	3.30	3.00	2.76
Hor. Parallax . . .	14.17	15.39	15.92	15.64	14.70	13.43	Hor. Parallax . . .	12.08	10.80	9.67	8.70	7.89	7.28

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

## GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	5 56 8.52	+22.554	+23 39 42.4	+29.32	23 24.7	1	10 9 12.69	+14.687	+12 17 31.8	-100.31	1 30.7
2	6 5 14.35	22.921	23 50 15.7	23.39	23 30.0	2	10 15 0.87	14.329	11 37 20.9	100.58	1 32.5
3	6 14 28.24	23.226	23 58 22.4	17.11	23 35.5	3	10 20 40.52	13.976	10 57 5.4	100.69	1 34.2
4	6 23 48.64	23.462	24 3 54.6	10.53	23 41.0	4	10 26 11.78	13.630	10 16 48.9	100.65	1 35.8
5	6 33 13.88	23.628	24 6 46.3	+3.74	23 46.5	5	10 31 34.78	13.288	9 36 35.2	100.46	1 37.2
6	6 42 42.22	+23.721	+24 6 52.9	-3.20	23 52.1	6	10 36 49.62	+12.950	+8 56 28.0	-100.11	1 38.5
7	6 52 11.90	23.740	24 4 12.4	10.19	23 57.7	7	10 41 56.39	12.615	8 16 30.8	99.62	1 39.7
8	7 1 41.20	23.690	23 58 44.3	17.15	0	8 10 46 55.14	12.281	7 36 47.1	98.99	1 40.7	
9	7 11 8.47	23.572	23 50 30.1	24.01	0 3.2	9 10 51 45.91	11.949	6 57 20.5	98.21	1 41.6	
10	7 20 32.15	23.392	23 39 33.0	30.71	0 8.7	10 10 56 28.69	11.616	6 18 14.3	97.28	1 42.4	
11	7 29 50.82	+23.156	+23 25 57.8	-37.19	0 14.0	11 11 1 3.45	+11.281	+5 39 32.1	-96.21	1 43.0	
12	7 39 3.23	22.871	23 9 50.2	43.39	0 19.3	12 11 5 30.13	10.942	5 1 17.5	94.99	1 43.5	
13	7 48 8.28	22.544	22 51 17.5	49.28	0 24.5	13 11 9 48.63	10.599	4 23 34.0	93.61	1 43.9	
14	7 57 5.04	22.181	22 30 27.5	54.83	0 29.5	14 11 13 58.82	10.249	3 46 25.5	92.07	1 44.1	
15	8 5 52.75	21.791	22 7 28.5	60.02	0 34.4	15 11 18 0.52	9.891	3 9 55.9	90.37	1 44.2	
16	8 14 30.84	+21.379	+21 42 29.1	-64.86	0 39.1	16 11 21 53.53	+9.524	+2 34 9.1	-88.50	1 44.1	
17	8 22 58.83	20.951	21 15 38.2	69.32	0 43.6	17 11 25 37.59	9.145	1 59 9.4	86.44	1 43.9	
18	8 31 16.41	20.512	20 47 4.5	73.43	0 47.9	18 11 29 12.41	8.754	1 25 1.4	84.19	1 43.5	
19	8 39 23.35	20.066	20 16 56.6	77.18	0 52.1	19 11 32 37.65	8.347	0 51 49.7	81.74	1 43.0	
20	8 47 19.57	19.619	19 45 22.7	80.59	0 56.1	20 11 35 52.92	7.922	+0 19 39.4	79.07	1 42.3	
21	8 55 5.04	+19.171	+19 12 30.9	-83.67	0 59.9	21 11 38 57.77	+7.478	-0 11 24.1	-76.17	1 41.4	
22	9 2 39.80	18.726	18 38 28.9	86.44	1 3.6	22 11 41 51.71	7.013	0 41 14.8	73.01	1 40.3	
23	9 10 3.94	18.286	18 3 24.1	88.91	1 7.0	23 11 44 34.19	6.523	1 9 46.5	69.59	1 39.1	
24	9 17 17.60	17.853	17 27 23.2	91.11	1 10.3	24 11 47 4.61	6.007	1 36 52.6	65.87	1 37.6	
25	9 24 20.94	17.427	16 50 32.9	93.04	1 13.4	25 11 49 22.31	5.463	2 2 25.7	61.83	1 36.0	
26	9 31 14.17	+17.010	+16 12 59.3	-94.72	1 16.4	26 11 51 26.57	+4.887	-2 26 17.9	-57.45	1 34.1	
27	9 37 57.48	16.601	15 34 48.2	96.17	1 19.2	27 11 53 16.61	4.278	2 48 20.6	52.71	1 32.0	
28	9 44 31.09	16.201	14 56 5.1	97.39	1 21.8	28 11 54 51.63	3.634	3 8 24.7	47.56	1 29.6	
29	9 50 55.21	15.810	14 16 55.1	98.41	1 24.2	29 11 56 10.75	2.953	3 26 20.3	41.98	1 27.0	
30	9 57 10.05	15.428	13 37 23.2	99.22	1 26.5	30 11 57 13.08	2.235	3 41 56.9	35.97	1 24.1	
31	10 3 15.81	+15.054	+12 57 34.0	-99.85	1 28.7	31 11 57 57.73	+1.479	-3 55 3.3	-29.48	1 20.8	
32	10 9 12.69	+14.687	+12 17 31.8	-100.31	1 30.7	32 11 58 23.80	+0.687	-4 5 28.0	-22.49	1 17.3	
Day of the Month.						Day of the Month.					
8d. 8th. 18th. 18th. 28d. 28th.						2d. 7th. 12th. 17th. 22d. 27th.					
Semidiameter . . . . .						Semidiameter . . . . .					
Hor. Parallax . . . . .						Hor. Parallax . . . . .					

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign - indicates that north declinations are decreasing or south declinations increasing.

## GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	11 58 23.80	+ 0.687	- 4 5 28.0	- 22.49	1 17.3	1	11 25 10.74	+ 9.524	+ 5 4 49.0	- 32.17	22 46.1
2	11 58 30.43	- 0.140	4 12 58.7	14.99	1 13.5	2	11 29 11.62	10.531	4 49 51.0	42.54	22 46.5
3	11 58 16.85	0.997	4 17 23.2	- 6.97	1 9.3	3	11 33 35.32	11.425	4 30 53.2	52.15	22 47.3
4	11 57 42.38	1.879	4 18 29.2	+ 1.55	1 4.8	4	11 38 19.16	12.209	4 8 14.5	60.94	22 48.4
5	11 56 46.55	2.777	4 16 5.1	10.53	0 59.9	5	11 43 20.52	12.886	3 42 14.9	68.89	22 49.7
6	11 55 29.08	- 3.678	- 4 10 0.4	+ 19.92	0 54.7	6	11 48 36.90	+ 13.463	+ 3 13 14.7	- 75.99	22 51.2
7	11 53 50.12	4.568	4 0 6.4	29.63	0 49.1	7	11 54 6.00	13.947	2 41 34.0	82.26	22 52.9
8	11 51 50.03	5.432	3 46 16.9	39.52	0 43.2	8	11 59 45.70	14.348	2 7 32.4	87.73	22 54.8
9	11 49 29.78	6.245	3 28 29.2	49.44	0 36.9	9	12 5 34.11	14.674	1 31 28.9	92.44	22 56.8
10	11 46 50.84	6.985	3 6 45.3	59.17	0 30.4	10	12 11 29.55	14.936	0 53 40.9	96.44	22 58.8
11	11 43 55.29	- 7.625	- 2 41 12.8	+ 68.45	0 23.5	11	12 17 30.58	+ 15.141	+ 0 14 24.9	- 99.78	23 1.0
12	11 40 45.86	8.138	2 12 5.7	77.00	0 16.4	12	12 23 35.96	15.299	- 0 26 3.9	102.52	23 3.2
13	11 37 25.91	8.496	1 39 45.1	84.52	0 9.2	13	12 29 44.63	15.417	1 7 31.7	104.71	23 5.4
14	11 33 59.45	8.677	1 4 39.2	90.72	0 1.9	14	12 35 55.74	15.503	1 49 46.1	106.41	23 7.7
15	11 30 30.99	8.660	- 0 27 23.6	95.29	23 47.1	15	12 42 8.55	15.561	2 32 35.8	107.66	23 10.0
16	11 27 5.45	- 8.430	+ 0 11 20.1	+ 98.02	23 39.9	16	12 48 22.50	+ 15.598	- 3 15 50.9	- 108.53	23 12.3
17	11 23 48.05	7.984	0 50 45.4	98.74	23 33.0	17	12 54 37.12	15.618	3 59 22.3	109.04	23 14.6
18	11 20 43.93	7.335	1 30 3.1	97.36	23 26.3	18	13 0 52.08	15.626	4 43 2.2	109.24	23 16.9
19	11 17 58.13	6.461	2 8 22.9	93.93	23 20.0	19	13 7 7.09	15.624	5 26 43.6	109.16	23 19.2
20	11 15 35.28	5.414	2 44 55.9	88.50	23 14.1	20	13 13 21.97	15.615	6 10 20.2	108.85	23 21.5
21	11 13 39.51	- 4.211	+ 3 18 56.8	+ 81.28	23 8.7	21	13 19 36.58	+ 15.602	- 6 53 46.6	- 108.31	23 23.8
22	11 12 14.15	2.883	3 49 44.9	72.49	23 3.9	22	13 25 50.85	15.587	7 36 57.8	107.59	23 26.1
23	11 11 21.88	- 1.461	4 16 45.9	62.40	22 59.7	23	13 32 4.73	15.570	8 19 49.6	106.70	23 28.4
24	11 11 4.47	+ 0.017	4 39 32.3	51.32	22 56.0	24	13 38 18.22	15.554	9 2 18.0	105.65	23 30.7
25	11 11 22.89	1.518	4 57 43.5	39.52	22 53.0	25	13 44 31.35	15.540	9 44 19.7	104.47	23 33.0
26	11 12 17.30	+ 3.012	+ 5 11 5.9	+ 27.30	22 50.5	26	13 50 44.16	+ 15.528	- 10 25 51.6	- 103.17	23 35.2
27	11 13 47.17	4.469	5 19 32.5	14.90	22 48.6	27	13 56 56.72	15.519	11 6 51.0	101.76	23 37.5
28	11 15 51.33	5.866	5 23 1.8	+ 2.57	22 47.3	28	14 3 9.11	15.514	11 47 15.4	100.25	23 39.8
29	11 18 28.10	7.183	5 21 38.1	- 9.49	22 46.4	29	14 9 21.40	15.512	12 27 2.5	98.66	23 42.0
30	11 21 35.37	8.406	5 15 29.7	21.12	22 46.0	30	14 15 33.71	15.515	13 6 10.3	96.98	23 44.3
31	11 25 10.74	+ 9.524	+ 5 4 49.0	- 32.17	22 46.1	31	14 21 46.13	+ 15.521	- 13 44 36.8	- 95.22	23 46.6
32	11 29 11.62	+ 10.531	+ 4 49 51.0	- 42.54	22 46.5	32	14 27 58.75	+ 15.532	- 14 22 20.3	- 93.39	23 48.9

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter . . .	4.52	4.91	5.19	5.15	4.73	4.10	Semidiameter . . .	3.51	3.07	2.77	2.57	2.45	2.37	2.33
Hor. Parallax . . .	11.92	12.95	13.67	13.58	12.47	10.81	Hor. Parallax . . .	9.26	8.08	7.29	6.77	6.44	6.24	6.13

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.



## GREENWICH MEAN TIME.

NOVEMBER.						DECEMBER.									
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.				
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.					
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m				
1	14 27 58.75	+15.532	14 22 20.3	-93.39	23 48.9	1	17 40 16.30	+16.140	25 41 58.1	-11.29	I 0.7				
2	14 34 11.68	15.547	14 59 19.0	91.49	23 51.1	2	17 46 42.40	16.030	25 45 46.2	7.71	I 3.2				
3	14 40 25.03	15.566	15 35 31.4	89.53	23 53.4	3	17 53 5.53	15.892	25 48 8.1	4.12	I 5.7				
4	14 46 38.89	15.590	16 10 56.0	87.51	23 55.7	4	17 59 24.99	15.723	25 49 3.3	-0.49	I 8.1				
5	14 52 53.36	15.617	16 45 31.3	85.42	23 58.0	5	18 5 39.97	15.518	25 48 31.6	+3.14	I 10.4				
6	14 59 8.52	+15.647	17 19 15.9	-83.28	.	6	18 11 49.55	+15.272	25 46 32.9	+6.76	I 12.6				
7	15 5 24.47	15.682	17 52 8.6	81.09	0 0.4	7	18 17 52.68	14.980	25 43 7.4	10.36	I 14.7				
8	15 11 41.28	15.719	18 24 7.8	78.84	0 2.7	8	18 23 48.18	14.636	25 38 16.1	13.91	I 16.6				
9	15 17 59.02	15.760	18 55 12.3	76.52	0 5.1	9	18 29 34.71	14.232	25 32 0.1	17.41	I 18.5				
10	15 24 17.77	15.803	19 25 20.7	74.16	0 7.4	10	18 35 10.76	13.760	25 24 21.1	20.82	I 20.1				
11	15 30 37.56	+15.847	19 54 31.7	-71.74	0 9.8	11	18 40 34.59	+13.213	25 15 21.7	+24.11	I 21.6				
12	15 36 58.45	15.894	20 22 43.9	69.27	0 12.2	12	18 45 44.30	12.581	25 5 5.0	27.25	I 22.8				
13	15 43 20.48	15.942	20 49 56.1	66.73	0 14.7	13	18 50 37.70	11.853	24 53 35.0	30.21	I 23.7				
14	15 49 43.68	15.991	21 16 6.7	64.15	0 17.1	14	18 55 12.39	11.019	24 40 56.6	32.94	I 24.3				
15	15 56 8.05	16.040	21 41 14.7	61.50	0 19.6	15	18 59 25.67	10.067	24 27 15.8	35.41	I 24.6				
16	16 2 33.59	+16.089	22 5 18.5	-58.80	0 22.1	16	19 3 14.59	+8.987	24 12 39.5	+37.56	I 24.4				
17	16 9 0.29	16.136	22 28 16.7	56.04	0 24.6	17	19 6 35.93	7.767	23 57 15.7	39.35	I 23.8				
18	16 15 28.12	16.182	22 50 8.0	53.22	0 27.1	18	19 9 26.25	6.400	23 41 13.8	40.74	I 22.7				
19	16 21 57.03	16.226	23 10 51.0	50.35	0 29.6	19	19 11 41.90	4.879	23 24 43.8	41.68	I 21.0				
20	16 28 26.94	16.266	23 30 24.2	47.41	0 32.2	20	19 13 19.21	3.204	23 7 56.7	42.16	I 18.6				
21	16 34 57.77	+16.302	23 48 46.1	-44.41	0 34.8	21	19 14 14.55	+1.383	22 51 3.9	+42.15	I 15.6				
22	16 41 29.40	16.333	24 5 55.3	41.35	0 37.4	22	19 14 24.59	-0.567	22 34 17.2	41.67	I 11.8				
23	16 48 1.70	16.357	24 21 50.5	38.24	0 40.0	23	19 13 46.55	2.617	22 17 48.0	40.70	I 7.2				
24	16 54 34.49	16.374	24 36 30.2	35.06	0 42.6	24	19 12 18.53	4.723	22 1 47.1	39.31	I 1.8				
25	17 1 7.58	16.382	24 49 52.9	31.82	0 45.2	25	19 9 59.92	6.822	21 46 24.0	37.56	0 55.5				
26	17 7 40.74	+16.379	25 1 57.2	-28.53	0 47.8	26	19 6 51.75	-8.838	21 31 46.9	+35.49	0 48.4				
27	17 14 13.69	16.364	25 12 41.8	25.18	0 50.4	27	19 2 57.05	10.684	21 18 2.6	33.17	0 40.6				
28	17 20 46.11	16.335	25 22 5.4	21.78	0 53.0	28	18 58 21.01	12.266	21 5 16.5	30.63	0 32.1				
29	17 27 17.64	16.290	25 30 6.7	18.33	0 55.6	29	18 53 11.05	13.497	20 53 33.7	27.91	0 23.0				
30	17 33 47.86	16.226	25 36 44.7	14.83	0 58.2	30	18 47 36.50	14.306	20 42 58.7	24.98	0 13.5				
31	17 40 16.30	+16.140	25 41 58.1	-11.29	I 0.7	31	18 41 48.05	-14.650	20 33 36.7	+21.82	0 3.8				
32	17 46 42.40	+16.030	25 45 46.2	-7.71	I 3.2	32	18 35 57.07	-14.518	20 25 33.5	+18.40	23 44.5				
Day of the Month.		5th.	10th.	15th.	20th.	25th.	30th.	Day of the Month.		5th.	10th.	15th.	20th.	25th.	30th.
		"	"	"	"	"	"			"	"	"	"	"	"
Semidiameter		2.31	2.32	2.36	2.41	2.48	2.62	Semidiameter		2.80	3.05	3.41	3.91	4.51	4.93
Hor. Parallax		6.10	6.12	6.21	6.36	6.58	6.91	Hor. Parallax		7.38	8.04	9.00	10.31	11.88	12.98

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign - indicates that north declinations are decreasing or south declinations increasing.

## GREENWICH MEAN TIME.

JANUARY.						FEBRUARY.								
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.			
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.				
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m			
1	15 36 14.75	+ 11.713	- 16 39 49.4	- 43.17	20 58.0	1	18 10 56.36	+ 13.006	- 21 59 55.4	- 4.41	21 31.0			
2	15 40 56.57	11.771	16 56 56.0	42.36	20 58.8	2	18 16 8.73	13.021	22 1 23.0	2.84	21 32.2			
3	15 45 39.78	11.829	17 13 42.3	41.51	20 59.6	3	18 21 21.43	13.034	22 2 12.8	- 1.27	21 33.5			
4	15 50 24.37	11.887	17 30 7.8	40.62	21 0.4	4	18 26 34.40	13.045	22 2 24.7	+ 0.30	21 34.7			
5	15 55 10.34	11.944	17 46 11.6	39.69	21 1.3	5	18 31 47.59	13.053	22 1 58.6	1.89	21 36.0			
6	15 59 57.67	+ 12.000	- 18 1 53.0	- 38.73	21 2.2	6	18 37 0.95	+ 13.058	- 22 0 54.3	+ 3.48	21 37.3			
7	16 4 46.35	12.056	18 17 11.0	37.74	21 3.1	7	18 42 14.41	13.061	21 59 11.8	5.07	21 38.6			
8	16 9 36.36	12.111	18 32 5.0	36.72	21 4.0	8	18 47 27.92	13.062	21 56 51.1	6.67	21 39.9			
9	16 14 27.68	12.165	18 46 34.1	35.67	21 4.9	9	18 52 41.43	13.061	21 53 52.0	8.26	21 41.2			
10	16 19 20.29	12.218	19 0 37.5	34.59	21 5.8	10	18 57 54.87	13.058	21 50 14.6	9.85	21 42.5			
11	16 24 14.16	+ 12.270	- 19 14 14.6	- 33.48	21 6.8	11	19 3 8.21	+ 13.052	- 21 45 59.0	+ 11.44	21 43.8			
12	16 29 9.27	12.321	19 27 24.6	32.34	21 7.8	12	19 8 21.36	13.044	21 41 5.2	13.03	21 45.1			
13	16 34 5.59	12.371	19 40 6.8	31.17	21 8.8	13	19 13 34.29	13.033	21 35 33.4	14.61	21 46.3			
14	16 39 3.08	12.419	19 52 20.4	29.97	21 9.8	14	19 18 46.94	13.020	21 29 23.6	16.19	21 47.6			
15	16 44 1.72	12.466	20 4 4.8	28.73	21 10.9	15	19 23 59.25	13.005	21 22 36.1	17.76	21 48.8			
16	16 49 1.47	+ 12.512	- 20 15 19.4	- 27.46	21 12.0	16	19 29 11.18	+ 12.988	- 21 15 11.0	+ 19.32	21 50.1			
17	16 54 2.30	12.556	20 26 3.4	26.17	21 13.1	17	19 34 22.68	12.969	21 7 8.5	20.87	21 51.3			
18	16 59 4.16	12.599	20 36 16.3	24.86	21 14.2	18	19 39 33.69	12.948	20 58 28.9	22.41	21 52.6			
19	17 4 7.02	12.640	20 45 57.5	23.53	21 15.3	19	19 44 44.17	12.925	20 49 12.5	23.94	21 53.8			
20	17 9 10.85	12.679	20 55 6.4	22.18	21 16.4	20	19 49 54.09	12.900	20 39 19.6	25.46	21 55.0			
21	17 14 15.61	+ 12.716	- 21 3 42.3	- 20.80	21 17.5	21	19 55 3.40	+ 12.874	- 20 28 50.5	+ 26.96	21 56.2			
22	17 19 21.24	12.752	21 11 44.9	19.40	21 18.7	22	20 0 12.05	12.846	20 17 45.5	28.45	21 57.4			
23	17 24 27.70	12.786	21 19 13.5	17.98	21 19.9	23	20 5 20.02	12.817	20 6 5.0	29.92	21 58.6			
24	17 29 34.98	12.818	21 26 7.9	16.54	21 21.1	24	20 10 27.27	12.786	19 53 49.4	31.37	21 59.8			
25	17 34 42.99	12.849	21 32 27.4	15.08	21 22.3	25	20 15 33.76	12.754	19 40 59.1	32.80	22 0.9			
26	17 39 51.73	+ 12.878	- 21 38 11.6	- 13.61	21 23.5	26	20 20 39.47	+ 12.721	- 19 27 34.5	+ 34.22	22 2.1			
27	17 45 1.12	12.905	21 43 20.1	12.12	21 24.7	27	20 25 44.37	12.687	19 13 36.1	35.62	22 3.2			
28	17 50 11.13	12.930	21 47 52.6	10.61	21 26.0	28	20 30 48.45	12.652	18 59 4.3	37.00	22 4.3			
29	17 55 21.70	12.952	21 51 48.7	9.08	21 27.2	29	20 35 51.67	12.616	18 43 59.7	38.37	22 5.4			
30	18 0 32.80	12.972	21 55 8.0	7.53	21 28.4	30	20 40 54.02	12.580	18 28 22.7	39.71	22 6.5			
31	18 5 44.37	+ 12.990	- 21 57 50.3	- 5.97	21 29.7	31	20 45 55.48	+ 12.543	- 18 12 13.9	+ 41.02	22 7.5			
32	18 10 56.36	+ 13.006	- 21 59 55.4	- 4.41	21 31.0	32	20 50 56.05	+ 12.505	- 17 55 33.7	+ 42.31	22 8.6			
Day of the Month.	0	5th.	10th.	15th.	20th.	25th.	30th.	Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
Semidiameter .	9.23	8.89	8.57	8.28	8.01	7.77	7.54	Semidiameter .	7.33	7.13	6.95	6.78	6.62	6.48
Hor. Parallax .	9.50	9.15	8.82	8.53	8.25	8.00	7.76	Hor. Parallax .	7.55	7.35	7.16	6.99	6.83	6.67

NOTE.—The sign + indicates north declinations; the sign - indicates south declinations.

## GREENWICH MEAN TIME.

MARCH.						APRIL.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	20 40 54.02	+12.580	-18 28 22.7	+39.71	22 6.5	1	23 9 31.68	+11.463	-6 51 44.1	+68.21	22 32.5
2	20 45 55.48	12.543	18 12 13.9	41.02	22 7.5	2	23 14 6.50	11.440	6 24 21.2	68.68	22 33.1
3	20 50 56.05	12.505	17 55 33.7	42.31	22 8.6	3	23 18 40.80	11.419	5 56 47.3	69.12	22 33.7
4	20 55 55.70	12.466	17 38 22.8	43.58	22 9.6	4	23 23 14.60	11.399	5 29 3.2	69.54	22 34.3
5	21 0 54.42	12.427	17 20 41.6	44.83	22 10.6	5	23 27 47.94	11.380	5 1 9.6	69.93	22 34.9
6	21 5 52.21	+12.388	-17 2 30.8	+46.05	22 11.6	6	23 32 20.85	+11.363	-4 33 7.1	+70.29	22 35.5
7	21 10 49.05	12.349	16 43 51.0	47.25	22 12.6	7	23 36 53.36	11.347	4 4 56.4	70.61	22 36.1
8	21 15 44.94	12.309	16 24 42.7	48.42	22 13.6	8	23 41 25.52	11.333	3 36 38.3	70.90	22 36.7
9	21 20 39.87	12.269	16 5 6.5	49.57	22 14.6	9	23 45 57.35	11.321	3 8 13.4	71.16	22 37.3
10	21 25 33.83	12.229	15 45 3.2	50.69	22 15.5	10	23 50 28.89	11.310	2 39 42.5	71.39	22 37.9
11	21 30 26.83	+12.189	-15 24 33.4	+51.78	22 16.4	11	23 55 0.18	+11.300	-2 11 6.2	+71.60	22 38.5
12	21 35 18.86	12.149	15 3 37.7	52.85	22 17.3	12	23 59 31.25	11.292	1 42 25.2	71.78	22 39.1
13	21 40 9.92	12.109	14 42 16.7	53.89	22 18.2	13	0 4 2.13	11.285	1 13 40.2	71.94	22 39.6
14	21 45 0.02	12.069	14 20 31.1	54.90	22 19.1	14	0 8 32.87	11.279	0 44 51.9	72.07	22 40.2
15	21 49 49.16	12.028	13 58 21.6	55.88	22 19.9	15	0 13 3.50	11.275	-0 16 1.1	72.17	22 40.7
16	21 54 37.35	+11.988	-13 35 48.9	+56.83	22 20.8	16	0 17 34.05	+11.272	+0 12 51.7	+72.24	22 41.2
17	21 59 24.59	11.949	13 12 53.6	57.76	22 21.6	17	0 22 4.57	11.271	0 41 45.6	72.27	22 41.8
18	22 4 10.91	11.910	12 49 36.5	58.66	22 22.5	18	0 26 35.08	11.272	1 10 40.0	72.27	22 42.4
19	22 8 56.31	11.872	12 25 58.1	59.53	22 23.3	19	0 31 5.63	11.274	1 39 34.2	72.24	22 42.9
20	22 13 40.80	11.835	12 1 59.3	60.36	22 24.1	20	0 35 36.25	11.277	2 8 27.5	72.18	22 43.5
21	22 18 24.39	+11.799	-11 37 40.7	+61.17	22 24.9	21	0 40 6.98	+11.282	+2 37 19.3	+72.10	22 44.1
22	22 23 7.12	11.763	11 13 2.9	61.95	22 25.7	22	0 44 37.86	11.289	3 6 8.7	71.99	22 44.7
23	22 27 49.00	11.728	10 48 6.7	62.71	22 26.4	23	0 49 8.92	11.298	3 34 55.2	71.85	22 45.3
24	22 32 30.05	11.694	10 22 52.7	63.44	22 27.1	24	0 53 40.21	11.309	4 3 38.0	71.69	22 45.9
25	22 37 10.29	11.660	9 57 21.6	64.14	22 27.8	25	0 58 11.77	11.322	4 32 16.5	71.50	22 46.5
26	22 41 49.74	+11.627	-9 31 34.2	+64.81	22 28.5	26	1 2 43.64	+11.336	+5 0 50.0	+71.28	22 47.1
27	22 46 28.44	11.596	9 5 31.1	65.45	22 29.2	27	1 7 15.86	11.351	5 29 17.7	71.03	22 47.7
28	22 51 6.41	11.566	8 39 13.0	66.06	22 29.9	28	1 11 48.47	11.368	5 57 39.0	70.75	22 48.3
29	22 55 43.69	11.538	8 12 40.6	66.64	22 30.5	29	1 16 21.50	11.386	6 25 53.3	70.43	22 48.9
30	23 0 20.31	11.512	7 45 54.5	67.19	22 31.2	30	1 20 55.01	11.406	6 53 59.8	70.08	22 49.5
31	23 4 56.29	+11.487	-7 18 55.4	+67.71	22 31.9	31	1 25 29.02	+11.428	+7 21 57.8	+69.71	22 50.1
32	23 9 31.68	+11.463	-6 51 44.1	+68.21	22 32.5	32	1 30 3.56	+11.451	+7 49 46.7	+69.31	22 50.8
Day of the Month.						Day of the Month.					
5th. 10th. 15th. 20th. 25th. 30th.						4th. 9th. 14th. 19th. 24th. 29th.					
Semidiameter . . 6.35 6.22 6.10 5.98 5.88 5.78						Semidiameter . . 5.69 5.61 5.53 5.46 5.39 5.32					
Hor. Parallax . . 6.53 6.40 6.28 6.16 6.05 5.95						Hor. Parallax . . 5.86 5.77 5.69 5.62 5.55 5.48					

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign - indicates that north declinations are decreasing or south declinations increasing.

## GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"			h m s	s	° ' "	"	
1	1 25 29.02	+ 11.428	+ 7 21 57.8	+ 69.71	22 50.1	1	3 53 55.66	+ 12.640	+ 19 33 55.7	+ 43.52	23 16.9
2	1 30 3.56	11.451	7 49 46.7	69.31	22 50.8	2	3 58 59.57	12.686	19 51 4.9	42.21	23 18.0
3	1 34 38.69	11.476	8 17 25.7	68.89	22 51.5	3	4 4 4.58	12.731	20 7 42.3	40.88	23 19.2
4	1 39 14.44	11.503	8 44 54.1	68.45	22 52.1	4	4 9 10.68	12.776	20 23 47.2	39.52	23 20.4
5	1 43 50.85	11.531	9 12 11.3	67.97	22 52.8	5	4 14 17.85	12.820	20 39 18.9	38.13	23 21.6
6	1 48 27.94	+ 11.561	+ 9 39 16.5	+ 67.46	22 53.5	6	4 19 26.08	+ 12.864	+ 20 54 17.0	+ 36.71	23 22.8
7	1 53 5.75	11.592	10 6 9.0	66.92	22 54.2	7	4 24 35.35	12.907	21 8 40.8	35.27	23 24.0
8	1 57 44.31	11.624	10 32 48.0	66.34	22 54.9	8	4 29 45.62	12.949	21 22 20.7	33.80	23 25.2
9	2 2 23.66	11.657	10 59 12.9	65.73	22 55.6	9	4 34 56.88	12.990	21 35 43.2	32.31	23 26.5
10	2 7 3.82	11.691	11 25 22.9	65.09	22 56.3	10	4 40 9.10	13.029	21 48 20.5	30.80	23 27.8
11	2 11 44.81	+ 11.726	+ 11 51 17.4	+ 64.43	22 57.1	11	4 45 22.24	+ 13.067	+ 22 0 21.3	+ 29.27	23 29.1
12	2 16 26.67	11.762	12 16 55.6	63.74	22 57.9	12	4 50 36.27	13.103	22 11 45.0	27.71	23 30.4
13	2 21 9.43	11.800	12 42 16.7	63.02	22 58.7	13	4 55 51.16	13.137	22 22 31.1	26.13	23 31.7
14	2 25 53.11	11.839	13 7 20.1	62.26	22 59.5	14	5 1 6.86	13.169	22 32 39.2	24.54	23 33.0
15	2 30 37.72	11.879	13 32 5.0	61.47	23 0.3	15	5 6 23.34	13.200	22 42 8.7	22.93	23 34.4
16	2 35 23.29	+ 11.920	+ 13 56 30.6	+ 60.65	23 1.1	16	5 11 40.54	+ 13.229	+ 22 50 59.3	+ 21.30	23 35.7
17	2 40 9.85	11.961	14 20 36.3	59.80	23 1.9	17	5 16 58.43	13.257	22 59 10.5	19.65	23 37.1
18	2 44 57.41	12.003	14 44 21.3	58.92	23 2.8	18	5 22 16.95	13.284	23 6 41.9	17.97	23 38.4
19	2 49 45.98	12.045	15 7 44.8	58.02	23 3.7	19	5 27 36.06	13.308	23 13 33.2	16.28	23 39.8
20	2 54 35.59	12.088	15 30 46.2	57.09	23 4.6	20	5 32 55.71	13.330	23 19 44.1	14.59	23 41.2
21	2 59 26.24	+ 12.132	+ 15 53 24.7	+ 56.13	23 5.5	21	5 38 15.84	+ 13.349	+ 23 25 14.2	+ 12.89	23 42.6
22	3 4 17.95	12.177	16 15 39.6	55.13	23 6.4	22	5 43 36.41	13.366	23 30 3.3	11.18	23 44.0
23	3 9 10.74	12.222	16 37 30.2	54.09	23 7.4	23	5 48 57.36	13.380	23 34 11.1	9.46	23 45.4
24	3 14 4.62	12.268	16 58 55.8	53.03	23 8.4	24	5 54 18.65	13.392	23 37 37.3	7.73	23 46.8
25	3 18 59.59	12.314	17 19 55.6	51.94	23 9.4	25	5 59 40.22	13.402	23 40 21.8	5.99	23 48.2
26	3 23 55.67	+ 12.360	+ 17 40 29.0	+ 50.83	23 10.4	26	6 5 2.01	+ 13.410	+ 23 42 24.5	+ 4.25	23 49.7
27	3 28 52.87	12.406	18 0 35.3	49.69	23 11.4	27	6 10 23.97	13.416	23 43 45.1	2.50	23 51.2
28	3 33 51.18	12.453	18 20 13.7	48.52	23 12.5	28	6 15 46.05	13.421	23 44 23.7	+ 0.75	23 52.6
29	3 38 50.62	12.500	18 39 23.7	47.31	23 13.6	29	6 21 8.18	13.423	23 44 20.1	- 1.01	23 54.1
30	3 43 51.18	12.547	18 58 4.5	46.07	23 14.7	30	6 26 30.32	13.422	23 43 34.2	2.77	23 55.5
31	3 48 52.86	+ 12.594	+ 19 16 15.4	+ 44.81	23 15.8	31	6 31 52.40	+ 13.419	+ 23 42 6.1	- 4.54	23 56.9
32	3 53 55.66	+ 12.640	+ 19 33 55.7	+ 43.52	23 16.9	32	6 37 14.38	+ 13.413	+ 23 39 55.8	- 6.30	23 58.3
Day of the Month.						Day of the Month.					
4th.						3d.					
9th.						8th.					
14th.						13th.					
19th.						18th.					
24th.						23d.					
29th.						28th.					
Semidiameter . . .						Semidiameter . . .					
Hor. Parallax . . .						Hor. Parallax . . .					
5.26						5.02					
5.42						5.17					
5.21						5.14					
5.16						4.97					
5.12						4.95					
5.08						4.94					
5.05						5.09					
5.27						5.12					
5.23						5.10					
5.20						5.08					

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	6 31 52.40	+ 13.419	+23 42 6.1	- 4.54	23 56.9	1	9 13 19.10	+ 12.388	+17 28 36.5	- 52.75	0 34.7
2	6 37 14.38	13.413	23 39 55.8	6.30	23 58.3	2	9 18 15.86	12.341	17 7 15.8	53.95	0 35.7
3	6 42 36.19	13.404	23 37 3.3	8.06	23 59.7	3	9 23 11.49	12.294	16 45 26.7	55.12	0 36.7
4	6 47 57.78	13.393	23 33 28.8	9.81		4	9 28 5.98	12.247	16 23 9.9	56.26	0 37.6
5	6 53 19.09	13.380	23 29 12.3	11.56	0 1.1	5	9 32 59.34	12.200	16 0 26.2	57.37	0 38.6
6	6 58 40.07	+ 13.365	+23 24 13.9	- 13.30	0 2.5	6	9 37 51.58	+ 12.154	+ 15 37 16.2	- 58.45	0 39.5
7	7 4 0.66	13.348	23 18 33.8	15.03	0 3.9	7	9 42 42.72	12.108	15 13 40.6	59.50	0 40.4
8	7 9 20.81	13.329	23 12 12.2	16.76	0 5.3	8	9 47 32.76	12.063	14 49 40.1	60.52	0 41.3
9	7 14 40.46	13.309	23 5 9.5	18.48	0 6.7	9	9 52 21.73	12.018	14 25 15.5	61.51	0 42.2
10	7 19 59.56	13.286	22 57 25.8	20.18	0 8.1	10	9 57 9.63	11.974	14 0 27.5	62.47	0 43.0
11	7 25 18.06	+ 13.260	+22 49 1.4	- 21.87	0 9.5	11	10 1 56.47	+ 11.930	+13 35 16.8	- 63.40	0 43.9
12	7 30 35.92	13.231	22 39 56.7	23.54	0 10.9	12	10 6 42.28	11.887	13 9 44.2	64.30	0 44.7
13	7 35 53.08	13.199	22 30 11.9	25.19	0 12.2	13	10 11 27.07	11.845	12 43 50.3	65.17	0 45.5
14	7 41 9.49	13.166	22 19 47.5	26.83	0 13.5	14	10 16 10.87	11.804	12 17 36.0	66.01	0 46.3
15	7 46 25.11	13.132	22 8 43.9	28.46	0 14.8	15	10 20 53.69	11.764	11 51 2.0	66.82	0 47.1
16	7 51 39.91	+ 13.097	+21 57 1.3	- 30.07	0 16.1	16	10 25 35.55	+ 11.725	+ 11 24 9.1	- 67.59	0 47.9
17	7 56 53.83	13.060	21 44 40.4	31.66	0 17.4	17	10 30 16.49	11.687	10 56 57.9	68.33	0 48.6
18	8 2 6.84	13.022	21 31 41.5	33.23	0 18.7	18	10 34 56.54	11.650	10 29 29.1	69.04	0 49.3
19	8 7 18.90	12.983	21 18 5.2	34.78	0 19.9	19	10 39 35.72	11.614	10 1 43.6	69.72	0 50.0
20	8 12 29.98	12.942	21 3 52.0	36.31	0 21.2	20	10 44 14.06	11.580	9 33 42.1	70.37	0 50.7
21	8 17 40.05	+ 12.900	+20 49 2.3	- 37.82	0 22.4	21	10 48 51.60	+ 11.548	+ 9 5 25.2	- 71.00	0 51.4
22	8 22 49.10	12.856	20 33 36.8	39.30	0 23.6	22	10 53 28.37	11.517	8 36 53.7	71.60	0 52.0
23	8 27 57.09	12.811	20 17 35.9	40.76	0 24.8	23	10 58 4.40	11.487	8 8 8.4	72.17	0 52.7
24	8 33 4.01	12.766	20 1 0.2	42.20	0 26.0	24	11 2 39.73	11.459	7 39 9.9	72.71	0 53.3
25	8 38 9.83	12.720	19 43 50.4	43.61	0 27.1	25	11 7 14.40	11.432	7 9 59.0	73.21	0 54.0
26	8 43 14.55	+ 12.674	+19 26 7.0	- 45.00	0 28.3	26	11 11 48.44	+ 11.406	+ 6 40 36.4	- 73.68	0 54.6
27	8 48 18.15	12.627	19 7 50.6	46.36	0 29.4	27	11 16 21.90	11.383	6 11 2.9	74.12	0 55.2
28	8 53 20.62	12.579	18 49 1.9	47.69	0 30.5	28	11 20 54.81	11.361	5 41 19.0	74.53	0 55.8
29	8 58 21.96	12.531	18 29 41.5	49.00	0 31.6	29	11 25 27.22	11.341	5 11 25.6	74.91	0 56.4
30	9 3 22.15	12.483	18 9 50.0	50.28	0 32.6	30	11 29 59.16	11.322	4 41 23.4	75.26	0 57.0
31	9 8 21.20	+ 12.435	+17 49 28.1	- 51.53	0 33.7	31	11 34 30.68	+ 11.305	+ 4 11 13.0	- 75.58	0 57.6
32	9 13 19.10	+ 12.388	+17 28 36.5	- 52.75	0 34.7	32	11 39 1.81	+ 11.290	+ 3 40 55.3	- 75.88	0 58.2

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.	Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
Semidiameter . .	4.92	4.92	4.93	4.94	4.95	4.96	Semidiameter . .	4.98	5.01	5.04	5.07	5.11	5.15
Hor. Parallax . .	5.08	5.07	5.07	5.08	5.09	5.11	Hor. Parallax . .	5.13	5.16	5.19	5.22	5.26	5.30

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign - indicates that north declinations are decreasing or south declinations increasing.

## GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.																		
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.													
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.														
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m													
1	11 39 1.81	+ 11.290	+ 3 40 55.3	- 75.88	0 58.2	1	13 55 4.08	+ 11.640	- 11 25 5.1	- 70.50	1 16.0													
2	11 43 32.61	11.277	3 10 30.9	76.15	0 58.8	2	13 59 43.87	11.677	11 53 9.3	69.85	1 16.7													
3	11 48 3.11	11.266	2 40 0.5	76.39	0 59.4	3	14 4 24.58	11.716	12 20 57.2	69.16	1 17.4													
4	11 52 33.35	11.256	2 9 24.9	76.59	0 59.9	4	14 9 6.23	11.756	12 48 28.1	68.43	1 18.1													
5	11 57 3.37	11.248	1 38 44.8	76.76	1 0.5	5	14 13 48.87	11.797	13 15 41.3	67.67	1 18.9													
6	12 1 33.22	+ 11.241	+ 1 8 0.8	- 76.90	1 1.0	6	14 18 32.51	+ 11.840	- 13 42 35.9	- 66.87	1 19.7													
7	12 6 2.96	11.236	0 37 13.8	77.01	1 1.5	7	14 23 17.20	11.884	14 9 11.0	66.04	1 20.5													
8	12 10 32.62	11.233	+ 0 6 24.4	77.09	1 2.1	8	14 28 2.94	11.929	14 35 26.0	65.18	1 21.3													
9	12 15 2.22	11.232	- 0 24 26.7	77.14	1 2.6	9	14 32 49.76	11.974	15 1 20.1	64.29	1 22.1													
10	12 19 31.81	11.233	0 55 18.6	77.16	1 3.2	10	14 37 37.69	12.020	15 26 52.4	63.37	1 23.0													
11	12 24 1.43	+ 11.236	- 1 26 10.6	- 77.16	1 3.8	11	14 42 26.74	+ 12.067	- 15 52 2.2	- 62.42	1 23.9													
12	12 28 31.13	11.241	1 57 2.1	77.13	1 4.3	12	14 47 16.93	12.115	16 16 48.8	61.43	1 24.8													
13	12 33 0.94	11.247	2 27 52.2	77.06	1 4.9	13	14 52 8.27	12.164	16 41 11.2	60.41	1 25.7													
14	12 37 30.91	11.254	2 58 40.3	76.95	1 5.5	14	14 57 0.78	12.213	17 5 8.7	59.36	1 26.7													
15	12 42 1.07	11.262	3 29 25.6	76.80	1 6.0	15	15 1 54.47	12.262	17 28 40.4	58.28	1 27.6													
16	12 46 31.47	+ 11.272	- 4 0 7.3	- 76.63	1 6.5	16	15 6 49.35	+ 12.311	- 17 51 45.7	- 57.15	1 28.6													
17	12 51 2.14	11.284	4 30 44.7	76.43	1 7.0	17	15 11 45.42	12.361	18 14 23.7	55.99	1 29.6													
18	12 55 33.13	11.298	5 1 17.1	76.21	1 7.6	18	15 16 42.70	12.411	18 36 33.6	54.80	1 30.6													
19	13 0 4.48	11.314	5 31 43.7	75.96	1 8.2	19	15 21 41.19	12.461	18 58 14.7	53.58	1 31.7													
20	13 4 36.24	11.332	6 2 3.8	75.68	1 8.8	20	15 26 40.88	12.512	19 19 26.2	52.34	1 32.7													
21	13 9 8.45	+ 11.352	- 6 32 16.8	- 75.38	1 9.4	21	15 31 41.79	+ 12.563	- 19 40 7.4	- 51.07	1 33.8													
22	13 13 41.14	11.373	7 2 21.9	75.05	1 10.0	22	15 36 43.90	12.613	20 0 17.5	49.77	1 34.9													
23	13 18 14.36	11.396	7 32 18.2	74.68	1 10.6	23	15 41 47.22	12.663	20 19 55.7	48.43	1 36.0													
24	13 22 48.16	11.421	8 2 5.0	74.27	1 11.2	24	15 46 51.74	12.713	20 39 1.4	47.06	1 37.1													
25	13 27 22.57	11.447	8 31 41.6	73.82	1 11.8	25	15 51 57.45	12.762	20 57 33.8	45.66	1 38.2													
26	13 31 57.62	+ 11.475	- 9 1 7.3	- 73.33	1 12.5	26	15 57 4.34	+ 12.811	- 21 15 32.2	- 44.21	1 39.4													
27	13 36 33.36	11.505	9 30 21.3	72.81	1 13.2	27	16 2 12.39	12.859	21 32 55.9	42.74	1 40.6													
28	13 41 9.83	11.536	9 59 22.8	72.27	1 13.9	28	16 7 21.59	12.906	21 49 44.3	41.25	1 41.8													
29	13 45 47.09	11.569	10 28 11.1	71.70	1 14.6	29	16 12 31.92	12.952	22 5 56.6	39.74	1 43.1													
30	13 50 25.17	11.604	10 56 45.5	71.11	1 15.3	30	16 17 43.35	12.998	22 21 32.2	38.20	1 44.3													
31	13 55 4.08	+ 11.640	- 11 25 5.1	- 70.50	1 16.0	31	16 22 55.86	+ 13.043	- 22 36 30.5	- 36.64	1 45.6													
32	13 59 43.87	+ 11.677	- 11 53 9.3	- 69.85	1 16.7	32	16 28 9.42	+ 13.086	- 22 50 50.8	- 35.04	1 46.9													
Day of the Month.						1st.	6th.	11th.	16th.	21st.	26th.	Day of the Month.			1st.	6th.	11th.	16th.	21st.	26th.	31st.			
Semidiameter . . .						5.20	5.25	5.30	5.36	5.43	5.50	Semidiameter . . .						5.57	5.65	5.74	5.83	5.93	6.04	6.15
Hor. Parallax . . .						5.35	5.40	5.46	5.52	5.59	5.66	Hor. Parallax . . .						5.74	5.82	5.91	6.00	6.10	6.21	6.33

NOTE.—The sign + indicates north declinations; the sign - indicates south declinations.

## GREENWICH MEAN TIME.

NOVEMBER.						DECEMBER.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	16 28 9.42	+13.086	-22 50 50.8	-35.04	1 46.9	1	19 8 46.83	+13.281	-24 32 29.7	+19.11	2 29.3
2	16 33 24.01	13.128	23 4 32.6	33.42	1 48.2	2	19 14 5.14	13.246	24 24 29.3	20.90	2 30.6
3	16 38 39.58	13.168	23 17 35.2	31.78	1 49.5	3	19 19 22.56	13.208	24 15 46.1	22.67	2 32.0
4	16 43 56.10	13.206	23 29 58.1	30.12	1 50.9	4	19 24 39.05	13.167	24 6 20.4	24.43	2 33.3
5	16 49 13.51	13.243	23 41 40.8	28.43	1 52.2	5	19 29 54.54	13.124	23 56 12.8	26.18	2 34.6
6	16 54 31.78	+13.278	-23 52 42.8	-26.72	1 53.6	6	19 35 8.97	+13.079	-23 45 23.6	+27.91	2 35.9
7	16 59 50.86	13.310	24 3 3.5	24.99	1 54.9	7	19 40 22.28	13.031	23 33 53.3	29.62	2 37.2
8	17 5 10.69	13.340	24 12 42.5	23.24	1 56.3	8	19 45 34.43	12.981	23 21 42.5	31.30	2 38.4
9	17 10 31.22	13.368	24 21 39.3	21.48	1 57.7	9	19 50 45.36	12.929	23 8 51.6	32.95	2 39.7
10	17 15 52.39	13.394	24 29 53.5	19.70	1 59.1	10	19 55 55.03	12.876	22 55 21.2	34.58	2 40.9
11	17 21 14.13	+13.417	-24 37 24.8	-17.90	2 0.5	11	20 1 3.39	+12.821	-22 41 11.9	+36.18	2 42.1
12	17 26 36.39	13.437	24 44 12.8	16.09	2 1.9	12	20 6 10.39	12.764	22 26 24.4	37.76	2 43.3
13	17 31 59.09	13.454	24 50 17.1	14.27	2 3.4	13	20 11 15.99	12.705	22 10 59.2	39.31	2 44.5
14	17 37 22.18	13.468	24 55 37.5	12.43	2 4.8	14	20 16 20.16	12.644	21 54 57.0	40.84	2 45.6
15	17 42 45.58	13.480	25 0 13.7	10.58	2 6.3	15	20 21 22.86	12.581	21 38 18.5	42.35	2 46.7
16	17 48 9.23	+13.489	-25 4 5.5	-8.73	2 7.7	16	20 26 24.06	+12.517	-21 21 4.3	+43.83	2 47.7
17	17 53 33.07	13.495	25 7 12.7	6.87	2 9.2	17	20 31 23.73	12.453	21 3 15.1	45.27	2 48.8
18	17 58 57.02	13.498	25 9 35.2	5.01	2 10.6	18	20 36 21.85	12.388	20 44 51.6	46.68	2 49.8
19	18 4 21.00	13.498	25 11 12.8	3.14	2 12.1	19	20 41 18.39	12.322	20 25 54.6	48.06	2 50.8
20	18 9 44.95	13.496	25 12 5.4	-1.26	2 13.6	20	20 46 13.33	12.256	20 6 24.8	49.41	2 51.8
21	18 15 8.81	+13.491	-25 12 13.1	+0.62	2 15.1	21	20 51 6.67	+12.189	-19 46 22.9	+50.72	2 52.7
22	18 20 32.50	13.483	25 11 35.7	2.50	2 16.5	22	20 55 58.38	12.121	19 25 49.6	52.01	2 53.6
23	18 25 55.95	13.472	25 10 13.4	4.38	2 18.0	23	21 0 48.45	12.053	19 4 45.8	53.27	2 54.5
24	18 31 19.09	13.457	25 8 6.1	6.25	2 19.4	24	21 5 36.87	11.984	18 43 12.2	54.50	2 55.4
25	18 36 41.85	13.439	25 5 14.0	8.12	2 20.8	25	21 10 23.65	11.915	18 21 9.5	55.70	2 56.2
26	18 42 4.16	+13.419	-25 1 37.1	+9.98	2 22.3	26	21 15 8.78	+11.846	-17 58 38.5	+56.87	2 57.0
27	18 47 25.97	13.396	24 57 15.8	11.83	2 23.7	27	21 19 52.27	11.777	17 35 40.0	58.00	2 57.8
28	18 52 47.20	13.371	24 52 10.1	13.67	2 25.1	28	21 24 34.11	11.709	17 12 14.7	59.10	2 58.6
29	18 58 7.80	13.343	24 46 20.4	15.50	2 26.5	29	21 29 14.31	11.641	16 48 23.5	60.16	2 59.3
30	19 3 27.70	13.313	24 39 46.8	17.31	2 27.9	30	21 33 52.88	11.573	16 24 7.1	61.19	3 0.0
31	19 8 46.83	+13.281	-24 32 29.7	+19.11	2 29.3	31	21 38 29.82	+11.505	-15 59 26.4	+62.19	3 0.7
32	19 14 5.14	+13.246	-24 24 29.3	+20.90	2 30.6	32	21 43 5.14	+11.438	-15 34 22.1	+63.16	3 1.3

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.	Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.	35th.
Semidiameter	"	"	"	"	"	"	Semidiameter	"	"	"	"	"	"	"
Hor. Parallax	6.27	6.40	6.53	6.67	6.83	7.00	Hor. Parallax	7.18	7.37	7.58	7.80	8.04	8.30	8.58
	6.45	6.58	6.72	6.87	7.03	7.20		7.39	7.59	7.80	8.03	8.27	8.54	8.84

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign — indicates that north declinations are decreasing or south declinations increasing.

## GREENWICH MEAN TIME.

JANUARY.						FEBRUARY.								
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.			
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.				
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m			
1	21 14 12.14	+7.825	17 14 6.3	+36.17	2 35.2	1	22 47 46.34	+7.288	8 37 18.9	+45.77	2 6.6			
2	21 17 19.70	7.806	16 59 32.8	36.61	2 34.4	2	22 50 41.09	7.274	8 18 58.4	45.94	2 5.6			
3	21 20 26.81	7.787	16 44 48.9	37.04	2 33.6	3	22 53 35.50	7.260	8 0 34.0	46.10	2 4.6			
4	21 23 33.46	7.768	16 29 54.7	37.46	2 32.8	4	22 56 29.58	7.247	7 42 5.8	46.25	2 3.5			
5	21 26 39.66	7.750	16 14 50.6	37.88	2 31.9	5	22 59 23.34	7.234	7 23 34.1	46.39	2 2.5			
6	21 29 45.42	+7.731	15 59 36.6	+38.29	2 31.1	6	23 2 16.80	+7.221	7 4 58.9	+46.52	2 1.5			
7	21 32 50.73	7.712	15 44 12.9	38.69	2 30.3	7	23 5 9.95	7.209	6 46 20.6	46.65	2 0.4			
8	21 35 55.59	7.693	15 28 39.7	39.08	2 29.4	8	23 8 2.81	7.197	6 27 39.3	46.77	1 59.3			
9	21 39 0.01	7.675	15 12 57.3	39.46	2 28.5	9	23 10 55.39	7.185	6 8 55.2	46.89	1 58.2			
10	21 42 4.00	7.657	14 57 5.9	39.82	2 27.6	10	23 13 47.69	7.174	5 50 8.5	47.00	1 57.2			
11	21 45 7.55	+7.639	14 41 5.7	+40.18	2 26.7	11	23 16 39.72	+7.163	5 31 19.5	+47.10	1 56.1			
12	21 48 10.67	7.621	14 24 56.8	40.53	2 25.8	12	23 19 31.50	7.152	5 12 28.2	47.19	1 55.0			
13	21 51 13.36	7.603	14 8 39.5	40.88	2 24.9	13	23 22 23.02	7.141	4 53 35.0	47.27	1 53.9			
14	21 54 15.63	7.585	13 52 14.0	41.22	2 24.0	14	23 25 14.30	7.131	4 34 39.9	47.33	1 52.8			
15	21 57 17.47	7.568	13 35 40.5	41.56	2 23.1	15	23 28 5.33	7.121	4 15 43.3	47.38	1 51.7			
16	22 0 18.88	+7.550	13 18 59.2	+41.88	2 22.2	16	23 30 56.13	+7.112	3 56 45.3	+47.43	1 50.6			
17	22 3 19.87	7.532	13 2 10.4	42.19	2 21.3	17	23 33 46.71	7.103	3 37 46.1	47.48	1 49.5			
18	22 6 20.45	7.515	12 45 14.2	42.49	2 20.4	18	23 36 37.07	7.094	3 18 45.8	47.52	1 48.4			
19	22 9 20.61	7.498	12 28 10.9	42.78	2 19.4	19	23 39 27.22	7.085	2 59 44.8	47.56	1 47.3			
20	22 12 20.36	7.481	12 11 0.8	43.06	2 18.4	20	23 42 17.16	7.077	2 40 43.1	47.59	1 46.2			
21	22 15 19.69	+7.464	11 53 43.9	+43.33	2 17.5	21	23 45 6.91	+7.069	2 21 41.2	+47.61	1 45.1			
22	22 18 18.62	7.447	11 36 20.6	43.59	2 16.5	22	23 47 56.46	7.061	2 2 39.0	47.61	1 44.0			
23	22 21 17.14	7.430	11 18 51.0	43.85	2 15.6	23	23 50 45.83	7.053	1 43 36.8	47.60	1 42.9			
24	22 24 15.26	7.413	11 1 15.4	44.10	2 14.6	24	23 53 35.02	7.046	1 24 34.8	47.58	1 41.7			
25	22 27 12.98	7.397	10 43 34.0	44.34	2 13.6	25	23 56 24.04	7.039	1 5 33.1	47.56	1 40.6			
26	22 30 10.31	+7.381	10 25 46.9	+44.57	2 12.6	26	23 59 12.89	+7.033	0 46 32.0	+47.53	1 39.5			
27	22 33 7.26	7.365	10 7 54.4	44.79	2 11.6	27	0 2 1.59	7.027	0 27 31.7	47.49	1 38.4			
28	22 36 3.82	7.349	9 49 56.8	45.00	2 10.6	28	0 4 50.16	7.021	0 8 32.3	47.45	1 37.3			
29	22 39 0.00	7.333	9 31 54.2	45.20	2 9.6	29	0 7 38.59	7.015	+ 0 10 26.0	47.40	1 36.1			
30	22 41 55.81	7.318	9 13 46.9	45.40	2 8.6	30	0 10 26.89	7.010	0 29 23.0	47.34	1 35.0			
31	22 44 51.25	+7.303	8 55 35.1	+45.59	2 7.6	31	0 13 15.06	+7.006	+ 0 48 18.6	+47.27	1 33.9			
32	22 47 46.34	+7.288	8 37 18.9	+45.77	2 6.6	32	0 16 3.13	+7.002	+ 1 7 12.6	+47.20	1 32.8			
Day of the Month.	0	5th.	10th.	15th.	20th.	25th.	30th.	Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
Semidiameter.	2.47	2.44	2.42	2.40	2.38	2.36	2.34	Semidiameter	2.31	2.29	2.27	2.25	2.23	2.21
Hor. Parallax.	4.30	4.26	4.22	4.18	4.14	4.10	4.07	Hor. Parallax	4.03	3.99	3.96	3.93	3.90	3.86

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.



## GREENWICH MEAN TIME.

MARCH.						APRIL.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	0 10 26.89	+7.010	+ 0 29 23.0	+47.34	1 35.0	1	1 37 7.67	+7.016	+ 9 51 6.4	+42.15	0 59.4
2	0 13 15.06	7.006	0 48 18.6	47.27	1 33.9	2	1 39 56.12	7.021	10 7 55.0	41.88	0 58.3
3	0 16 3.13	7.002	1 7 12.6	47.20	1 32.8	3	1 42 44.69	7.026	10 24 37.1	41.61	0 57.1
4	0 18 51.10	6.998	1 26 4.8	47.13	1 31.6	4	1 45 33.37	7.031	10 41 12.5	41.33	0 56.0
5	0 21 38.99	6.994	1 44 55.1	47.05	1 30.4	5	1 48 22.17	7.037	10 57 41.0	41.04	0 54.9
6	0 24 26.80	+6.991	+ 2 3 43.2	+46.96	1 29.3	6	1 51 11.12	+7.043	+11 14 2.5	+40.75	0 53.7
7	0 27 14.54	6.988	2 22 29.1	46.86	1 28.2	7	1 54 0.21	7.049	11 30 16.9	40.45	0 52.6
8	0 30 2.23	6.986	2 41 12.5	46.75	1 27.0	8	1 56 49.45	7.055	11 46 24.0	40.15	0 51.5
9	0 32 49.87	6.984	2 59 53.3	46.64	1 25.8	9	1 59 38.84	7.061	12 2 23.8	39.84	0 50.4
10	0 35 37.46	6.982	3 18 31.3	46.52	1 24.6	10	2 2 28.39	7.067	12 18 16.1	39.52	0 49.3
11	0 38 25.02	+6.981	+ 3 37 6.4	+46.39	1 23.5	11	2 5 18.09	+7.073	+12 34 0.6	+39.20	0 48.2
12	0 41 12.56	6.980	3 55 38.3	46.25	1 22.4	12	2 8 7.96	7.080	12 49 37.4	38.87	0 47.1
13	0 44 0.08	6.980	4 14 7.0	46.11	1 21.2	13	2 10 57.99	7.087	13 5 6.3	38.54	0 46.0
14	0 46 47.59	6.979	4 32 32.2	45.97	1 20.0	14	2 13 48.19	7.095	13 20 27.1	38.20	0 44.9
15	0 49 35.09	6.979	4 50 53.8	45.82	1 18.8	15	2 16 38.56	7.102	13 35 39.7	37.85	0 43.8
16	0 52 22.59	+6.979	+ 5 9 11.6	+45.66	1 17.7	16	2 19 29.11	+7.109	+13 50 44.0	+37.50	0 42.7
17	0 55 10.10	6.980	5 27 25.4	45.49	1 16.6	17	2 22 19.83	7.116	14 5 39.8	37.14	0 41.6
18	0 57 57.63	6.980	5 45 35.1	45.31	1 15.4	18	2 25 10.72	7.124	14 20 27.0	36.78	0 40.5
19	1 0 45.18	6.981	6 3 40.5	45.13	1 14.2	19	2 28 1.79	7.132	14 35 5.5	36.42	0 39.4
20	1 3 32.75	6.983	6 21 41.5	44.94	1 13.1	20	2 30 53.04	7.139	14 49 35.1	36.06	0 38.3
21	1 6 20.36	+6.984	+ 6 39 37.8	+44.74	1 12.0	21	2 33 44.46	+7.146	+15 3 55.7	+35.69	0 37.2
22	1 9 8.00	6.986	6 57 29.3	44.53	1 10.8	22	2 36 36.06	7.153	15 18 7.2	35.31	0 36.1
23	1 11 55.68	6.988	7 15 15.9	44.32	1 9.7	23	2 39 27.84	7.161	15 32 9.5	34.92	0 35.0
24	1 14 43.41	6.990	7 32 57.4	44.11	1 8.5	24	2 42 19.80	7.169	15 46 2.4	34.51	0 34.0
25	1 17 31.19	6.992	7 50 33.6	43.89	1 7.4	25	2 45 11.94	7.176	15 59 45.8	34.11	0 32.9
26	1 20 19.03	+6.995	+ 8 8 4.3	+43.66	1 6.3	26	2 48 4.27	+7.183	+16 13 19.6	+33.70	0 31.8
27	1 23 6.93	6.998	8 25 29.5	43.42	1 5.1	27	2 50 56.78	7.191	16 26 43.8	33.29	0 30.7
28	1 25 54.91	7.001	8 42 48.9	43.18	1 4.0	28	2 53 49.48	7.199	16 39 58.1	32.88	0 29.6
29	1 28 42.97	7.004	9 0 2.5	42.93	1 2.8	29	2 56 42.36	7.207	16 53 2.5	32.47	0 28.6
30	1 31 31.11	7.008	9 17 10.0	42.68	1 1.7	30	2 59 35.44	7.215	17 5 56.9	32.05	0 27.5
31	1 34 19.34	+7.012	+ 9 34 11.3	+42.42	1 0.6	31	3 2 28.71	+7.223	+17 18 41.2	+31.63	0 26.5
32	1 37 7.67	+7.016	+ 9 51 6.4	+42.15	0 59.4	32	3 5 22.18	+7.231	+17 31 15.3	+31.20	0 25.4
Day of the Month. 5th. 10th. 15th. 20th. 25th. 30th.						Day of the Month. 4th. 9th. 14th. 19th. 24th. 29th.					
Semidiameter . . . 2.19 2.18 2.16 2.15 2.13 2.12						Semidiameter . . . 2.10 2.09 2.08 2.07 2.06 2.04					
Hor. Parallax . . . 3.83 3.80 3.77 3.74 3.71 3.69						Hor. Parallax . . . 3.66 3.64 3.62 3.60 3.58 3.56					

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign - indicates that north declinations are decreasing or south declinations increasing.

## GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"			h m s	s	° ' "	"	h m
1	3 2 28.71	+ 7.223	+ 17 18 41.2	+ 31.63	0 26.5	1	4 33 28.01	+ 7.424	+ 22 21 39.5	+ 16.72	23 54.2
2	3 5 22.18	7.231	17 31 15.3	31.20	0 25.4	2	4 36 26.23	7.428	22 28 14.6	16.20	23 53.3
3	3 8 15.85	7.240	17 43 39.0	30.77	0 24.4	3	4 39 24.53	7.431	22 34 37.1	15.67	23 52.3
4	3 11 9.72	7.249	17 55 52.3	30.34	0 23.3	4	4 42 22.91	7.434	22 40 47.0	15.15	23 51.4
5	3 14 3.79	7.258	18 7 55.1	29.90	0 22.3	5	4 45 21.35	7.437	22 46 44.3	14.62	23 50.4
6	3 16 58.06	+ 7.266	+ 18 19 47.3	+ 29.46	0 21.2	6	4 48 19.85	+ 7.439	+ 22 52 29.0	+ 14.09	23 49.5
7	3 19 52.52	7.274	18 31 28.8	29.01	0 20.2	7	4 51 18.40	7.441	22 58 1.0	13.57	23 48.5
8	3 22 47.18	7.282	18 42 59.5	28.56	0 19.2	8	4 54 17.00	7.442	23 3 20.2	13.04	23 47.5
9	3 25 42.04	7.290	18 54 19.4	28.10	0 18.2	9	4 57 15.63	7.443	23 8 26.7	12.51	23 46.6
10	3 28 37.09	7.298	19 5 28.2	27.64	0 17.1	10	5 0 14.29	7.443	23 13 20.5	11.98	23 45.6
11	3 31 32.33	+ 7.306	+ 19 16 26.0	+ 27.17	0 16.1	11	5 3 12.97	+ 7.444	+ 23 18 1.4	+ 11.45	23 44.7
12	3 34 27.76	7.314	19 27 12.6	26.70	0 15.1	12	5 6 11.65	7.444	23 22 29.6	10.91	23 43.7
13	3 37 23.37	7.321	19 37 48.0	26.23	0 14.1	13	5 9 10.34	7.445	23 26 45.0	10.37	23 42.7
14	3 40 19.16	7.328	19 48 12.1	25.76	0 13.1	14	5 12 9.01	7.444	23 30 47.6	9.84	23 41.8
15	3 43 15.12	7.335	19 58 24.7	25.28	0 12.1	15	5 15 7.66	7.443	23 34 37.4	9.31	23 40.8
16	3 46 11.25	+ 7.342	+ 20 8 25.8	+ 24.80	0 11.1	16	5 18 6.28	+ 7.441	+ 23 38 14.3	+ 8.78	23 39.9
17	3 49 7.54	7.349	20 18 15.4	24.32	0 10.1	17	5 21 4.86	7.439	23 41 38.4	8.24	23 38.9
18	3 52 4.00	7.356	20 27 53.3	23.83	0 9.1	18	5 24 3.38	7.437	23 44 49.6	7.70	23 37.9
19	3 55 0.60	7.362	20 37 19.4	23.34	0 8.1	19	5 27 1.84	7.434	23 47 48.0	7.17	23 37.0
20	3 57 57.36	7.368	20 46 33.7	22.84	0 7.1	20	5 30 0.23	7.431	23 50 33.6	6.63	23 36.0
21	4 0 54.25	+ 7.374	+ 20 55 36.1	+ 22.34	0 6.1	21	5 32 58.53	+ 7.427	+ 23 53 6.4	+ 6.10	23 35.0
22	4 3 51.28	7.379	21 4 26.5	21.84	0 5.1	22	5 35 56.74	7.423	23 55 26.4	5.56	23 34.0
23	4 6 48.44	7.384	21 13 4.9	21.34	0 4.1	23	5 38 54.86	7.419	23 57 33.5	5.03	23 33.1
24	4 9 45.73	7.389	21 21 31.2	20.84	0 3.1	24	5 41 52.87	7.415	23 59 27.9	4.50	23 32.1
25	4 12 43.13	7.394	21 29 45.3	20.33	0 2.1	25	5 44 50.77	7.410	24 1 9.5	3.97	23 31.1
26	4 15 40.66	+ 7.399	+ 21 37 47.2	+ 19.82	0 1.1	26	5 47 48.55	+ 7.405	+ 24 2 38.4	+ 3.44	23 30.1
27	4 18 38.29	7.404	21 45 36.8	19.31	0 0.1	27	5 50 46.20	7.400	24 3 54.5	2.91	23 29.1
28	4 21 36.03	7.408	21 53 14.2	18.80	23 58.2	28	5 53 43.72	7.394	24 4 58.0	2.38	23 28.1
29	4 24 33.88	7.412	22 0 39.2	18.28	23 57.2	29	5 56 41.10	7.388	24 5 48.8	1.85	23 27.1
30	4 27 31.83	7.416	22 7 51.8	17.76	23 56.2	30	5 59 38.33	7.381	24 6 27.0	1.32	23 26.1
31	4 30 29.87	+ 7.420	+ 22 14 51.9	+ 17.24	23 55.2	31	6 2 35.41	+ 7.374	+ 24 6 52.6	+ 0.80	23 25.1
32	4 33 28.01	+ 7.424	+ 22 21 39.5	+ 16.72	23 54.2	32	6 5 32.32	+ 7.367	+ 24 7 5.6	+ 0.28	23 24.1

Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.	Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
Semidiameter . . .	2.03	2.02	2.01	2.01	2.00	1.99	Semidiameter . . .	1.99	1.98	1.98	1.98	1.97	1.97
Hor. Parallax . . .	3.54	3.53	3.51	3.50	3.48	3.47	Hor. Parallax . . .	3.46	3.46	3.45	3.44	3.44	3.44

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

## GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	6 2 35.41	+7.374	+24 6 52.6	+0.80	23 25.1	1	7 32 2.31	+7.005	+22 41 5.3	-14.17	22 52.3
2	6 5 32.32	7.367	24 7 5.6	+0.28	23 24.1	2	7 34 50.23	6.989	22 35 20.1	14.60	22 51.1
3	6 8 29.06	7.360	24 7 6.3	-0.24	23 23.1	3	7 37 37.77	6.973	22 29 24.7	15.03	22 50.0
4	6 11 25.62	7.352	24 6 54.4	0.76	23 22.1	4	7 40 24.93	6.957	22 23 19.1	15.45	22 48.8
5	6 14 21.99	7.344	24 6 30.1	1.28	23 21.1	5	7 43 11.71	6.941	22 17 3.4	15.87	22 47.7
6	6 17 18.17	+7.336	+24 5 53.5	-1.79	23 20.1	6	7 45 58.10	+6.925	+22 10 37.8	-16.28	22 46.5
7	6 20 14.15	7.328	24 5 4.5	2.30	23 19.1	7	7 48 44.09	6.908	22 4 2.4	16.68	22 45.3
8	6 23 9.91	7.319	24 4 3.2	2.81	23 18.1	8	7 51 29.68	6.891	21 57 17.2	17.08	22 44.1
9	6 26 5.45	7.310	24 2 49.7	3.32	23 17.1	9	7 54 14.87	6.874	21 50 22.3	17.48	22 42.9
10	6 29 0.77	7.301	24 1 24.1	3.82	23 16.1	10	7 56 59.64	6.857	21 43 17.9	17.87	22 41.7
11	6 31 55.84	+7.291	+23 59 46.3	-4.32	23 15.0	11	7 59 44.00	+6.840	+21 36 4.1	-18.26	22 40.5
12	6 34 50.66	7.280	23 57 56.6	4.82	23 13.9	12	8 2 27.94	6.822	21 28 41.0	18.65	22 39.3
13	6 37 45.22	7.268	23 55 54.9	5.32	23 12.9	13	8 5 11.46	6.804	21 21 8.7	19.03	22 38.1
14	6 40 39.51	7.256	23 53 41.3	5.81	23 11.8	14	8 7 54.55	6.786	21 13 27.3	19.40	22 36.9
15	6 43 33.52	7.244	23 51 15.9	6.30	23 10.8	15	8 10 37.20	6.768	21 5 36.9	19.77	22 35.7
16	6 46 27.25	+7.232	+23 48 38.7	-6.79	23 9.7	16	8 13 19.41	+6.750	+20 57 37.7	-20.14	22 34.4
17	6 49 20.68	7.220	23 45 49.8	7.28	23 8.6	17	8 16 1.20	6.732	20 49 29.7	20.51	22 33.2
18	6 52 13.81	7.207	23 42 49.2	7.76	23 7.5	18	8 18 42.56	6.714	20 41 13.0	20.87	22 31.9
19	6 55 6.62	7.194	23 39 37.1	8.24	23 6.5	19	8 21 23.47	6.696	20 32 47.8	21.22	22 30.6
20	6 57 59.10	7.181	23 36 13.6	8.72	23 5.4	20	8 24 3.94	6.678	20 24 14.1	21.57	22 29.3
21	7 0 51.26	+7.167	+23 32 38.6	-9.19	23 4.4	21	8 26 43.98	+6.660	+20 15 32.1	-21.92	22 28.0
22	7 3 43.09	7.153	23 28 52.3	9.66	23 3.3	22	8 29 23.58	6.641	20 6 41.9	22.26	22 26.7
23	7 6 34.59	7.139	23 24 54.8	10.13	23 2.2	23	8 32 2.75	6.623	19 57 43.5	22.59	22 25.4
24	7 9 25.75	7.125	23 20 46.1	10.59	23 1.2	24	8 34 41.48	6.605	19 48 37.1	22.92	22 24.1
25	7 12 16.56	7.111	23 16 26.3	11.05	23 0.1	25	8 37 19.78	6.587	19 39 22.8	23.25	22 22.8
26	7 15 7.03	+7.096	+23 11 55.6	-11.51	22 59.0	26	8 39 57.65	+6.569	+19 30 0.7	-23.58	22 21.5
27	7 17 57.15	7.081	23 7 14.0	11.96	22 57.9	27	8 42 35.09	6.551	19 20 31.0	23.90	22 20.2
28	7 20 46.91	7.066	23 2 21.5	12.41	22 56.8	28	8 45 12.09	6.533	19 10 53.6	24.21	22 18.9
29	7 23 36.31	7.051	22 57 18.3	12.85	22 55.7	29	8 47 48.67	6.515	19 1 8.8	24.52	22 17.6
30	7 26 25.34	7.036	22 52 4.5	13.29	22 54.6	30	8 50 24.83	6.497	18 51 16.6	24.82	22 16.2
31	7 29 14.01	+7.021	+22 46 40.1	-13.73	22 53.4	31	8 53 0.56	+6.479	+18 41 17.2	-25.12	22 14.8
32	7 32 2.31	+7.005	+22 41 5.3	-14.17	22 52.3	32	8 55 35.87	+6.462	+18 31 10.7	-25.42	22 13.5
Day of the Month.						Day of the Month.					
3d. 8th. 13th. 18th. 23d. 28th.						2d. 7th. 12th. 17th. 22d. 27th.					
Semidiameter . . . . .						Semidiameter . . . . .					
Hor. Parallax . . . . .						Hor. Parallax . . . . .					

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign - indicates that north declinations are decreasing or south declinations increasing.

## GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"			h m s	s	° ' "	"	
1	8 55 35.87	+ 6.462	+ 18 31 10.7	- 25.42	22 13.5	1	10 10 2.61	+ 5.962	+ 12 42 10.4	- 32.06	21 29.6
2	8 58 10.75	6.444	18 20 57.1	25.71	22 12.1	2	10 12 25.51	5.947	12 29 19.2	32.21	21 28.0
3	9 0 45.21	6.426	18 10 36.6	26.00	22 10.8	3	10 14 48.06	5.932	12 16 24.4	32.36	21 26.4
4	9 3 19.25	6.409	18 0 9.4	26.28	22 9.4	4	10 17 10.27	5.918	12 3 26.2	32.50	21 24.8
5	9 5 52.87	6.392	17 49 35.5	26.55	22 8.0	5	10 19 32.14	5.904	11 50 24.7	32.63	21 23.2
6	9 8 26.07	+ 6.375	+ 17 38 55.0	- 26.82	22 6.6	6	10 21 53.66	+ 5.890	+ 11 37 19.9	- 32.76	21 21.6
7	9 10 58.85	6.357	17 28 8.2	27.08	22 5.2	7	10 24 14.84	5.875	11 24 12.1	32.89	21 20.0
8	9 13 31.20	6.339	17 17 14.8	27.34	22 3.8	8	10 26 35.68	5.861	11 11 1.2	33.01	21 18.4
9	9 16 3.13	6.321	17 6 15.4	27.60	22 2.4	9	10 28 56.18	5.847	10 57 47.4	33.13	21 16.8
10	9 18 34.64	6.303	16 55 9.9	27.85	22 0.9	10	10 31 16.35	5.833	10 44 30.9	33.24	21 15.2
11	9 21 5.72	+ 6.286	+ 16 43 58.4	- 28.10	21 59.5	11	10 33 36.18	+ 5.819	+ 10 31 11.8	- 33.35	21 13.6
12	9 23 36.38	6.268	16 32 41.2	28.34	21 58.0	12	10 35 55.67	5.805	10 17 50.1	33.45	21 12.0
13	9 26 6.62	6.250	16 21 18.2	28.58	21 56.6	13	10 38 14.83	5.791	10 4 26.0	33.55	21 10.4
14	9 28 36.44	6.233	16 9 49.6	28.81	21 55.1	14	10 40 33.67	5.778	9 50 59.5	33.65	21 8.8
15	9 31 5.84	6.216	15 58 15.5	29.03	21 53.7	15	10 42 52.18	5.765	9 37 30.8	33.74	21 7.1
16	9 33 34.83	+ 6.199	+ 15 46 36.1	- 29.25	21 52.3	16	10 45 10.38	+ 5.752	+ 9 23 59.9	- 33.83	21 5.4
17	9 36 3.40	6.182	15 34 51.4	29.47	21 50.8	17	10 47 28.26	5.739	9 10 27.0	33.91	21 3.8
18	9 38 31.57	6.165	15 23 1.5	29.68	21 49.3	18	10 49 45.84	5.726	8 56 52.1	33.99	21 2.1
19	9 40 59.33	6.148	15 11 6.5	29.89	21 47.8	19	10 52 3.11	5.713	8 43 15.4	34.06	21 0.5
20	9 43 26.70	6.132	14 59 6.6	30.10	21 46.3	20	10 54 20.08	5.701	8 29 36.9	34.13	20 58.8
21	9 45 53.66	+ 6.116	+ 14 47 1.8	- 30.30	21 44.8	21	10 56 36.76	+ 5.689	+ 8 15 56.8	- 34.20	20 57.2
22	9 48 20.25	6.100	14 34 52.3	30.49	21 43.3	22	10 58 53.15	5.677	8 2 15.1	34.26	20 55.5
23	9 50 46.44	6.084	14 22 38.1	30.68	21 41.8	23	11 1 9.26	5.665	7 48 31.9	34.32	20 53.8
24	9 53 12.25	6.068	14 10 19.4	30.87	21 40.3	24	11 3 25.08	5.653	7 34 47.4	34.38	20 52.1
25	9 55 37.68	6.052	13 57 56.3	31.05	21 38.8	25	11 5 40.63	5.642	7 21 1.6	34.43	20 50.4
26	9 58 2.75	+ 6.037	+ 13 45 28.8	- 31.23	21 37.3	26	11 7 55.91	+ 5.631	+ 7 7 14.6	- 34.48	20 48.7
27	10 0 27.44	6.022	13 32 57.2	31.40	21 35.7	27	11 10 10.93	5.620	6 53 26.5	34.52	20 47.0
28	10 2 51.77	6.007	13 20 21.4	31.57	21 34.2	28	11 12 25.68	5.609	6 39 37.4	34.56	20 45.3
29	10 5 15.74	5.992	13 7 41.6	31.74	21 32.6	29	11 14 40.18	5.598	6 25 47.4	34.60	20 43.6
30	10 7 39.35	5.977	12 54 57.9	31.90	21 31.1	30	11 16 54.42	5.587	6 11 56.7	34.64	20 41.9
31	10 10 2.61	+ 5.962	+ 12 42 10.4	- 32.06	21 29.6	31	11 19 8.41	+ 5.577	+ 5 58 5.2	- 34.67	20 40.2
32	10 12 25.51	+ 5.947	+ 12 29 19.2	- 32.21	21 28.0	32	11 21 22.14	+ 5.566	+ 5 44 13.2	- 34.69	20 38.5
Day of the Month.						Day of the Month.					
1st. 6th. 11th. 16th. 21st. 26th.						1st. 6th. 11th. 16th. 21st. 26th. 31st.					
Semidiameter . . . 2.06 2.08 2.10 2.11 2.13 2.15						Semidiameter . . . 2.18 2.21 2.24 2.27 2.30 2.34 2.38					
Hor. Parallax . . . 3.58 3.61 3.64 3.68 3.71 3.75						Hor. Parallax . . . 3.79 3.84 3.89 3.95 4.01 4.07 4.14					

NOTE.—The sign + indicates north declinations; the sign - indicates south declinations.

## GREENWICH MEAN TIME.

NOVEMBER.						DECEMBER.										
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.					
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.						
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m					
1	11 21 22.14	+ 5.566	+ 5 44 13.2	- 34.69	20 38.5	1	12 26 24.20	+ 5.285	- 1 8 4.5	- 33.46	19 45.2					
2	11 23 35.63	5.555	5 30 20.6	34.70	20 36.8	2	12 28 30.94	5.276	1 21 26.5	33.36	19 43.4					
3	11 25 48.86	5.545	5 16 27.7	34.71	20 35.1	3	12 30 37.46	5.267	1 34 46.1	33.26	19 41.5					
4	11 28 1.84	5.535	5 2 34.5	34.71	20 33.3	4	12 32 43.77	5.258	1 48 3.1	33.15	19 39.7					
5	11 30 14.57	5.525	4 48 41.2	34.72	20 31.6	5	12 34 49.86	5.249	2 1 17.5	33.04	19 37.9					
6	11 32 27.06	+ 5.515	+ 4 34 47.8	- 34.72	20 29.8	6	12 36 55.73	+ 5.240	- 2 14 29.1	- 32.92	19 36.0					
7	11 34 39.30	5.505	4 20 54.4	34.71	20 28.1	7	12 39 1.38	5.231	2 27 37.9	32.80	19 34.2					
8	11 36 51.29	5.495	4 7 1.2	34.70	20 26.3	8	12 41 6.80	5.222	2 40 43.8	32.68	19 32.3					
9	11 39 3.03	5.485	3 53 8.3	34.69	20 24.6	9	12 43 11.99	5.212	2 53 46.6	32.55	19 30.5					
10	11 41 14.53	5.475	3 39 15.8	34.68	20 22.8	10	12 45 16.95	5.202	3 6 46.3	32.42	19 28.6					
11	11 43 25.79	+ 5.465	+ 3 25 23.7	- 34.66	20 21.1	11	12 47 21.69	+ 5.193	- 3 19 42.9	- 32.29	19 26.8					
12	11 45 36.81	5.455	3 11 32.2	34.64	20 19.3	12	12 49 26.19	5.183	3 32 36.2	32.15	19 24.9					
13	11 47 47.59	5.445	2 57 41.4	34.61	20 17.6	13	12 51 30.46	5.173	3 45 26.1	32.01	19 23.1					
14	11 49 58.13	5.435	2 43 51.3	34.58	20 15.8	14	12 53 34.49	5.163	3 58 12.5	31.87	19 21.2					
15	11 52 8.43	5.425	2 30 2.0	34.54	20 14.1	15	12 55 38.29	5.153	4 10 55.5	31.72	19 19.4					
16	11 54 18.51	+ 5.415	+ 2 16 13.6	- 34.50	20 12.3	16	12 57 41.85	+ 5.144	- 4 23 35.0	- 31.57	19 17.5					
17	11 56 28.37	5.406	2 2 26.2	34.46	20 10.5	17	12 59 45.18	5.134	4 36 10.8	31.41	19 15.6					
18	11 58 38.01	5.397	1 48 39.9	34.41	20 8.7	18	1 1 48.27	5.124	4 48 42.9	31.25	19 13.7					
19	12 0 47.42	5.388	1 34 54.7	34.36	20 6.9	19	1 3 51.12	5.114	5 1 11.1	31.09	19 11.8					
20	12 2 56.62	5.379	1 21 10.8	34.30	20 5.2	20	1 3 53.73	5.104	5 13 35.4	30.93	19 9.9					
21	12 5 5.60	+ 5.370	+ 1 7 28.3	- 34.24	20 3.4	21	1 3 7 56.10	+ 5.094	- 5 25 55.7	- 30.76	19 8.0					
22	12 7 14.38	5.361	0 53 47.2	34.18	20 1.6	22	1 3 9 58.22	5.084	5 38 12.1	30.59	19 6.1					
23	12 9 22.95	5.352	0 40 7.6	34.12	19 59.8	23	1 3 12 0.10	5.074	5 50 24.4	30.42	19 4.2					
24	12 11 31.31	5.344	0 26 29.6	34.05	19 58.0	24	1 3 14 1.73	5.063	6 2 32.6	30.25	19 2.2					
25	12 13 39.47	5.336	+ 0 12 53.2	33.98	19 56.2	25	1 3 16 3.11	5.052	6 14 36.5	30.07	19 0.3					
26	12 15 47.43	+ 5.327	- 0 0 41.4	- 33.90	19 54.4	26	1 3 18 4.22	+ 5.041	- 6 26 36.1	- 29.89	18 58.3					
27	12 17 55.19	5.318	0 14 14.1	33.82	19 52.6	27	1 3 20 5.07	5.030	6 38 31.4	29.70	18 56.4					
28	12 20 2.75	5.310	0 27 44.9	33.74	19 50.8	28	1 3 22 5.65	5.018	6 50 22.2	29.51	18 54.4					
29	12 22 10.10	5.302	0 41 13.6	33.65	19 48.9	29	1 3 24 5.94	5.006	7 2 8.4	29.32	18 52.5					
30	12 24 17.25	5.294	0 54 40.2	33.56	19 47.1	30	1 3 26 5.94	4.994	7 13 50.0	29.13	18 50.6					
31	12 26 24.20	+ 5.285	- 1 8 4.5	- 33.46	19 45.2	31	1 3 28 5.64	+ 4.981	- 7 25 26.8	- 28.93	18 48.6					
32	12 28 30.94	+ 5.276	- 1 21 26.5	- 33.36	19 43.4	32	1 3 30 5.03	+ 4.968	- 7 36 58.8	- 28.73	18 46.7					
Day of the Month.		5th.	10th.	15th.	20th.	25th.	30th.	Day of the Month.		5th.	10th.	15th.	20th.	25th.	30th.	35th.
		"	"	"	"	"	"			"	"	"	"	"	"	"
Semidiameter		2.42	2.46	2.51	2.56	2.62	2.68	Semidiameter		2.75	2.82	2.89	2.97	3.06	3.15	3.26
Hor. Parallax		4.21	4.29	4.37	4.46	4.56	4.67	Hor. Parallax		4.78	4.90	5.04	5.18	5.33	5.49	5.67

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign - indicates that north declinations are decreasing or south declinations increasing.

## GREENWICH MEAN TIME.

JANUARY.						FEBRUARY.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	23 17 10.40	+ 1.431	- 5 55 43.4	+ 9.57	4 37.7	1	23 38 14.18	+ 1.921	- 3 35 44.2	+ 12.72	2 56.7
2	23 17 45.01	1.452	5 51 52.1	9.70	4 34.3	2	23 39 0.40	1.932	3 30 38.1	12.79	2 53.5
3	23 18 20.08	1.472	5 47 57.8	9.82	4 30.9	3	23 39 46.90	1.943	3 25 30.2	12.86	2 50.4
4	23 18 55.61	1.492	5 44 0.5	9.95	4 27.5	4	23 40 33.66	1.954	3 20 20.6	12.93	2 47.2
5	23 19 31.61	1.511	5 40 0.2	10.07	4 24.2	5	23 41 20.67	1.965	3 15 9.4	13.00	2 44.1
6	23 20 8.07	+ 1.529	- 5 35 57.0	+ 10.19	4 20.9	6	23 42 7.93	+ 1.975	- 3 9 56.5	+ 13.07	2 40.9
7	23 20 44.98	1.548	5 31 50.9	10.31	4 17.6	7	23 42 55.45	1.985	3 4 42.0	13.14	2 37.8
8	23 21 22.33	1.566	5 27 42.0	10.43	4 14.3	8	23 43 43.22	1.995	2 59 25.9	13.20	2 34.6
9	23 22 0.11	1.584	5 23 30.3	10.55	4 11.0	9	23 44 31.22	2.005	2 54 8.4	13.26	2 31.5
10	23 22 38.33	1.602	5 19 15.8	10.66	4 7.7	10	23 45 19.45	2.015	2 48 49.4	13.32	2 28.4
11	23 23 16.98	+ 1.619	- 5 14 58.5	+ 10.77	4 4.4	11	23 46 7.91	+ 2.024	- 2 43 28.9	+ 13.38	2 25.3
12	23 23 56.03	1.636	5 10 38.6	10.88	4 1.1	12	23 46 56.60	2.033	2 38 7.0	13.44	2 22.1
13	23 24 35.49	1.653	5 6 16.1	10.99	3 57.8	13	23 47 45.50	2.042	2 32 43.8	13.50	2 19.0
14	23 25 15.36	1.670	5 1 51.1	11.10	3 54.6	14	23 48 34.61	2.051	2 27 19.3	13.55	2 15.9
15	23 25 55.64	1.686	4 57 23.4	11.21	3 51.4	15	23 49 23.93	2.059	2 21 53.5	13.60	2 12.8
16	23 26 36.30	+ 1.702	- 4 52 53.2	+ 11.31	3 48.1	16	23 50 13.45	+ 2.067	- 2 16 26.4	+ 13.65	2 9.6
17	23 27 17.34	1.718	4 48 20.5	11.41	3 44.8	17	23 51 3.16	2.075	2 10 58.2	13.70	2 6.5
18	23 27 58.77	1.734	4 43 45.3	11.51	3 41.6	18	23 51 53.05	2.083	2 5 28.9	13.75	2 3.4
19	23 28 40.57	1.749	4 39 7.8	11.61	3 38.3	19	23 52 43.13	2.090	1 59 58.4	13.79	2 0.3
20	23 29 22.72	1.764	4 34 28.0	11.71	3 35.1	20	23 53 33.39	2.097	1 54 26.8	13.84	1 57.2
21	23 30 5.22	+ 1.779	- 4 29 46.0	+ 11.80	3 31.8	21	23 54 23.81	+ 2.104	- 1 48 54.3	+ 13.88	1 54.1
22	23 30 48.08	1.793	4 25 1.7	11.89	3 28.6	22	23 55 14.39	2.111	1 43 20.8	13.92	1 51.0
23	23 31 31.28	1.807	4 20 15.1	11.98	3 25.4	23	23 56 5.14	2.118	1 37 46.3	13.96	1 47.9
24	23 32 14.82	1.821	4 15 26.4	12.07	3 22.2	24	23 56 56.04	2.124	1 32 10.9	14.00	1 44.9
25	23 32 58.67	1.834	4 10 35.6	12.16	3 19.0	25	23 57 47.08	2.130	1 26 34.7	14.03	1 41.8
26	23 33 42.83	+ 1.847	- 4 5 42.7	+ 12.25	3 15.8	26	23 58 38.27	+ 2.136	- 1 20 57.7	+ 14.06	1 38.8
27	23 34 27.30	1.860	4 0 47.7	12.33	3 12.6	27	23 59 29.60	2.141	1 15 19.8	14.09	1 35.7
28	23 35 12.08	1.873	3 55 50.8	12.41	3 9.4	28	0 0 21.06	2.147	1 9 41.2	14.12	1 32.7
29	23 35 57.17	1.885	3 50 52.0	12.49	3 6.2	29	0 1 12.64	2.152	1 4 2.0	14.15	1 29.6
30	23 36 42.58	1.897	3 45 51.2	12.57	3 3.1	30	0 2 4.35	2.157	0 58 22.1	14.18	1 26.5
31	23 37 28.24	+ 1.909	- 3 40 48.6	+ 12.65	2 59.9	31	0 2 56.18	+ 2.162	- 0 52 41.5	+ 14.20	1 23.4
32	23 38 14.18	+ 1.921	- 3 35 44.2	+ 12.72	2 56.7	32	0 3 48.13	+ 2.167	- 0 47 0.3	+ 14.23	1 20.4
Day of the Month.	2d.	10th.	18th.	26th.		Day of the Month.	8d.	11th.	19th.	27th.	
Semidiameter . . . . .	17.92	17.54	17.20	16.89		Semidiameter . . . . .	16.63	16.41	16.22	16.07	
Horizontal Parallax . . .	1.68	1.64	1.60	1.58		Horizontal Parallax . . .	1.55	1.53	1.52	1.50	

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

## GREENWICH MEAN TIME.

MARCH.						APRIL.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	0 2 4.35	+ 2.157	- 0 58 22.1	+ 14.18	1 26.5	1	0 29 25.03	+ 2.223	+ 1 59 35.3	+ 14.28	23 48.7
2	0 2 56.18	2.162	0 52 41.5	14.20	1 23.4	2	0 30 18.37	2.222	2 5 17.8	14.26	23 45.7
3	0 3 48.13	2.167	0 47 0.3	14.23	1 20.4	3	0 31 11.69	2.221	2 10 59.9	14.24	23 42.6
4	0 4 40.18	2.172	0 41 18.6	14.25	1 17.3	4	0 32 4.99	2.220	2 16 41.5	14.22	23 39.6
5	0 5 32.34	2.176	0 35 36.3	14.27	1 14.2	5	0 32 58.26	2.219	2 22 22.5	14.20	23 36.5
6	0 6 24.61	+ 2.180	- 0 29 53.5	+ 14.29	1 11.1	6	0 33 51.51	+ 2.218	+ 2 28 2.9	+ 14.18	23 33.5
7	0 7 16.98	2.184	0 24 10.2	14.31	1 8.1	7	0 34 44.73	2.217	2 33 42.7	14.15	23 30.4
8	0 8 9.44	2.187	0 18 26.5	14.33	1 5.0	8	0 35 37.91	2.215	2 39 21.9	14.12	23 27.4
9	0 9 1.99	2.191	0 12 42.4	14.35	1 1.9	9	0 36 31.04	2.213	2 45 0.4	14.09	23 24.3
10	0 9 54.63	2.195	0 6 57.8	14.36	0 58.9	10	0 37 24.13	2.211	2 50 38.2	14.06	23 21.3
11	0 10 47.36	+ 2.198	- 0 1 13.0	+ 14.37	0 55.8	11	0 38 17.17	+ 2.209	+ 2 56 15.2	+ 14.03	23 18.2
12	0 11 40.16	2.201	+ 0 4 32.0	14.38	0 52.8	12	0 39 10.16	2.207	3 1 51.4	14.00	23 15.2
13	0 12 33.03	2.204	0 10 17.2	14.39	0 49.7	13	0 40 3.08	2.204	3 7 26.8	13.97	23 12.1
14	0 13 25.97	2.207	0 16 2.6	14.40	0 46.6	14	0 40 55.93	2.201	3 13 1.4	13.93	23 9.1
15	0 14 18.98	2.210	0 21 48.3	14.40	0 43.6	15	0 41 48.72	2.198	3 18 35.2	13.89	23 6.0
16	0 15 12.04	+ 2.212	+ 0 27 34.1	+ 14.41	0 40.5	16	0 42 41.43	+ 2.195	+ 3 24 8.0	+ 13.85	23 2.9
17	0 16 5.15	2.214	0 33 20.0	14.41	0 37.5	17	0 43 34.06	2.192	3 29 39.8	13.81	22 59.8
18	0 16 58.32	2.216	0 39 6.1	14.42	0 34.4	18	0 44 26.61	2.188	3 35 10.6	13.77	22 56.8
19	0 17 51.53	2.218	0 44 52.2	14.42	0 31.4	19	0 45 19.07	2.184	3 40 40.4	13.72	22 53.7
20	0 18 44.77	2.219	0 50 38.2	14.42	0 28.3	20	0 46 11.43	2.180	3 46 9.2	13.68	22 50.7
21	0 19 38.05	+ 2.220	+ 0 56 24.1	+ 14.41	0 25.3	21	0 47 3.69	+ 2.176	+ 3 51 36.8	+ 13.63	22 47.6
22	0 20 31.36	2.221	1 2 9.9	14.41	0 22.2	22	0 47 55.85	2.172	3 57 3.3	13.58	22 44.6
23	0 21 24.68	2.222	1 7 55.6	14.40	0 19.2	23	0 48 47.91	2.167	4 2 28.7	13.53	22 41.5
24	0 22 18.02	2.223	1 13 41.1	14.39	0 16.1	24	0 49 39.85	2.162	4 7 52.8	13.48	22 38.5
25	0 23 11.38	2.223	1 19 26.4	14.38	0 13.1	25	0 50 31.67	2.157	4 13 15.7	13.43	22 35.4
26	0 24 4.75	+ 2.224	+ 1 25 11.6	+ 14.37	0 10.0	26	0 51 23.37	+ 2.152	+ 4 18 37.4	+ 13.38	22 32.4
27	0 24 58.14	2.224	1 30 56.4	14.36	0 7.0	27	0 52 14.96	2.147	4 23 58.0	13.32	22 29.3
28	0 25 51.53	2.224	1 36 40.9	14.35	0 4.0	28	0 53 6.42	2.142	4 29 17.1	13.27	22 26.2
29	0 26 44.92	2.224	1 42 25.1	14.34	0 0.9	29	0 53 57.74	2.137	4 34 34.9	13.22	22 23.1
30	0 27 38.30	2.224	1 48 8.9	14.32	23 54.8	30	0 54 48.93	2.131	4 39 51.4	13.16	22 20.0
31	0 28 31.67	+ 2.223	+ 1 53 52.3	+ 14.30	23 51.8	31	0 55 39.99	+ 2.125	+ 4 45 6.5	+ 13.10	22 16.9
32	0 29 25.03	+ 2.223	+ 1 59 35.3	+ 14.28	23 48.7	32	0 56 30.91	+ 2.119	+ 4 50 20.2	+ 13.04	22 13.8
Day of the Month.		6th.	14th.	22d.	30th.	Day of the Month.		7th.	15th.	23d.	
Semidiameter . . . . .		15.95	15.88	15.82	15.81	Semidiameter . . . . .		15.84	15.90	16.00	
Horizontal Parallax . . . . .		1.49	1.48	1.48	1.48	Horizontal Parallax . . . . .		1.48	1.49	1.49	

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign - indicates that north declinations are decreasing or south declinations increasing.

## GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	0 55 39.99	+ 2.125	+ 4 45 6.5	+ 13.10	22 16.9	1	1 20 28.40	+ 1.843	+ 7 13 44.2	+ 10.68	20 39.5
2	0 56 30.91	2.119	4 50 20.2	13.04	22 13.8	2	1 21 12.48	1.830	7 17 59.2	10.58	20 36.3
3	0 57 21.68	2.113	4 55 32.4	12.98	22 10.7	3	1 21 56.26	1.817	7 22 11.9	10.48	20 33.1
4	0 58 12.30	2.106	5 0 43.2	12.92	22 7.6	4	1 22 39.73	1.804	7 26 22.2	10.38	20 29.9
5	0 59 2.76	2.099	5 5 52.5	12.86	22 4.5	5	1 23 22.89	1.791	7 30 30.1	10.28	20 26.7
6	0 59 53.07	+ 2.092	+ 5 11 0.3	+ 12.80	22 1.4	6	1 24 5.73	+ 1.778	+ 7 34 35.5	+ 10.17	20 23.5
7	1 0 43.21	2.085	5 16 6.5	12.73	21 58.3	7	1 24 48.25	1.764	7 38 38.5	10.07	20 20.3
8	1 1 33.18	2.078	5 21 11.1	12.66	21 55.2	8	1 25 30.43	1.750	7 42 39.0	9.97	20 17.1
9	1 2 22.99	2.071	5 26 14.1	12.59	21 52.1	9	1 26 12.27	1.736	7 46 37.0	9.86	20 13.8
10	1 3 12.61	2.064	5 31 15.5	12.52	21 49.0	10	1 26 53.77	1.722	7 50 32.4	9.75	20 10.6
11	1 4 2.05	+ 2.056	+ 5 36 15.1	+ 12.45	21 45.9	11	1 27 34.92	+ 1.707	+ 7 54 25.2	+ 9.64	20 7.3
12	1 4 51.30	2.048	5 41 13.1	12.38	21 42.7	12	1 28 15.70	1.692	7 58 15.4	9.53	20 4.0
13	1 5 40.36	2.040	5 46 9.3	12.31	21 39.6	13	1 28 56.11	1.677	8 2 2.9	9.42	20 0.7
14	1 6 29.22	2.032	5 51 3.7	12.24	21 36.5	14	1 29 36.16	1.661	8 5 47.8	9.31	19 57.5
15	1 7 17.87	2.023	5 55 56.3	12.16	21 33.4	15	1 30 15.83	1.645	8 9 30.0	9.20	19 54.2
16	1 8 6.31	+ 2.014	+ 6 0 47.1	+ 12.08	21 30.2	16	1 30 55.11	+ 1.629	+ 8 13 9.4	+ 9.09	19 50.9
17	1 8 54.53	2.005	6 5 36.0	12.00	21 27.1	17	1 31 33.99	1.612	8 16 46.0	8.97	19 47.6
18	1 9 42.53	1.996	6 10 23.0	11.92	21 24.0	18	1 32 12.48	1.595	8 20 19.7	8.85	19 44.3
19	1 10 30.30	1.986	6 15 8.0	11.84	21 20.9	19	1 32 50.57	1.578	8 23 50.7	8.73	19 41.0
20	1 11 17.84	1.976	6 19 51.0	11.76	21 17.7	20	1 33 28.24	1.561	8 27 18.8	8.61	19 37.7
21	1 12 5.14	+ 1.966	+ 6 24 32.1	+ 11.67	21 14.6	21	1 34 5.49	+ 1.544	+ 8 30 44.0	+ 8.49	19 34.4
22	1 12 52.20	1.956	6 29 11.1	11.59	21 11.4	22	1 34 42.32	1.526	8 34 6.3	8.37	19 31.1
23	1 13 39.01	1.946	6 33 48.1	11.50	21 8.2	23	1 35 18.73	1.508	8 37 25.7	8.25	19 27.7
24	1 14 25.57	1.935	6 38 23.0	11.41	21 5.0	24	1 35 54.70	1.490	8 40 42.1	8.13	19 24.4
25	1 15 11.87	1.924	6 42 55.8	11.32	21 1.9	25	1 36 30.23	1.471	8 43 55.6	8.00	19 21.0
26	1 15 57.91	+ 1.913	+ 6 47 26.5	+ 11.23	20 58.7	26	1 37 5.31	+ 1.452	+ 8 47 6.1	+ 7.87	19 17.7
27	1 16 43.68	1.902	6 51 55.0	11.14	20 55.5	27	1 37 39.94	1.433	8 50 13.5	7.75	19 14.3
28	1 17 29.18	1.891	6 56 21.3	11.05	20 52.3	28	1 38 14.11	1.414	8 53 17.9	7.62	19 10.9
29	1 18 14.41	1.879	7 0 45.4	10.96	20 49.1	29	1 38 47.82	1.395	8 56 19.2	7.49	19 7.5
30	1 18 59.37	1.867	7 5 7.3	10.87	20 45.9	30	1 39 21.08	1.376	8 59 17.4	7.36	19 4.1
31	1 19 44.03	+ 1.855	+ 7 9 26.9	+ 10.78	20 42.7	31	1 39 53.85	+ 1.356	+ 9 2 12.5	+ 7.23	19 0.7
32	1 20 28.40	+ 1.843	+ 7 13 44.2	+ 10.68	20 39.5	32	1 40 26.13	+ 1.335	+ 9 5 4.4	+ 7.10	18 57.3
Day of the Month.		1st.	9th.	17th.	25th.	Day of the Month.		2d.	10th.	18th.	26th.
Semidiameter . . . .		16.13	16.28	16.48	16.71	Semidiameter . . . .		16.98	17.29	17.62	18.00
Horizontal Parallax . .		1.51	1.52	1.54	1.56	Horizontal Parallax . .		1.58	1.62	1.65	1.68

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.



## GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"			h m s	s	° ' "	"	
1	1 39 53.85	+ 1.356	+ 9 2 12.5	+ 7.23	19 0.7	1	1 52 13.27	+ 0.589	+ 10 4 11.9	+ 2.61	17 10.9
2	1 40 26.13	1.335	9 5 4.4	7.10	18 57.3	2	1 52 27.05	0.560	10 5 12.5	2.45	17 7.2
3	1 40 57.92	1.314	9 7 53.1	6.97	18 53.9	3	1 52 40.12	0.531	10 6 9.1	2.28	17 3.5
4	1 41 29.21	1.293	9 10 38.6	6.83	18 50.5	4	1 52 52.50	0.502	10 7 1.8	2.11	16 59.7
5	1 42 0.00	1.272	9 13 20.9	6.70	18 47.1	5	1 53 4.17	0.472	10 7 50.5	1.94	16 56.0
6	1 42 30.27	+ 1.250	+ 9 15 59.9	+ 6.56	18 43.7	6	1 53 15.13	+ 0.442	+ 10 8 35.1	+ 1.78	16 52.2
7	1 43 0.01	1.228	9 18 35.5	6.42	18 40.2	7	1 53 25.35	0.412	10 9 15.7	1.61	16 48.5
8	1 43 29.23	1.206	9 21 7.8	6.28	18 36.8	8	1 53 34.84	0.381	10 9 52.3	1.44	16 44.7
9	1 43 57.91	1.183	9 23 36.7	6.14	18 33.3	9	1 53 43.60	0.350	10 10 24.8	1.27	16 40.9
10	1 44 26.04	1.160	9 26 2.2	6.00	18 29.9	10	1 53 51.63	0.319	10 10 53.2	1.10	16 37.1
11	1 44 53.62	+ 1.137	+ 9 28 24.3	+ 5.85	18 26.4	11	1 53 58.92	+ 0.288	+ 10 11 17.5	+ 0.93	16 33.3
12	1 45 20.64	1.114	9 30 43.0	5.71	18 22.9	12	1 54 5.46	0.257	10 11 37.7	0.76	16 29.4
13	1 45 47.09	1.090	9 32 58.2	5.56	18 19.4	13	1 54 11.26	0.226	10 11 53.9	0.59	16 25.6
14	1 46 12.96	1.066	9 35 9.8	5.41	18 15.9	14	1 54 16.31	0.195	10 12 5.9	0.41	16 21.7
15	1 46 38.25	1.042	9 37 17.9	5.26	18 12.3	15	1 54 20.61	0.164	10 12 13.8	0.24	16 17.9
16	1 47 2.97	+ 1.017	+ 9 39 22.4	+ 5.11	18 8.8	16	1 54 24.15	+ 0.133	+ 10 12 17.6	+ 0.07	16 14.0
17	1 47 27.08	0.992	9 41 23.3	4.96	18 5.2	17	1 54 26.94	0.101	10 12 17.3	- 0.10	16 10.1
18	1 47 50.58	0.967	9 43 20.6	4.81	18 1.7	18	1 54 28.97	0.070	10 12 12.8	0.28	16 6.2
19	1 48 13.48	0.942	9 45 14.3	4.66	17 58.1	19	1 54 30.24	0.038	10 12 4.2	0.45	16 2.3
20	1 48 35.77	0.916	9 47 4.3	4.51	17 54.6	20	1 54 30.75	+ 0.006	10 11 51.5	0.62	15 58.3
21	1 48 57.44	+ 0.890	+ 9 48 50.7	+ 4.36	17 51.0	21	1 54 30.51	- 0.026	+ 10 11 34.6	- 0.79	15 54.4
22	1 49 18.48	0.864	9 50 33.3	4.21	17 47.4	22	1 54 29.51	0.058	10 11 13.6	0.96	15 50.4
23	1 49 38.89	0.838	9 52 12.2	4.05	17 43.8	23	1 54 27.75	0.090	10 10 48.5	1.13	15 46.5
24	1 49 58.67	0.811	9 53 47.4	3.89	17 40.2	24	1 54 25.23	0.122	10 10 19.3	1.30	15 42.5
25	1 50 17.81	0.784	9 55 18.9	3.73	17 36.6	25	1 54 21.94	0.153	10 9 46.1	1.47	15 38.5
26	1 50 36.29	+ 0.757	+ 9 56 46.6	+ 3.57	17 33.0	26	1 54 17.90	- 0.185	+ 10 9 8.8	- 1.64	15 34.5
27	1 50 54.12	0.730	9 58 10.4	3.41	17 29.3	27	1 54 13.10	0.216	10 8 27.4	1.81	15 30.5
28	1 51 11.30	0.702	9 59 30.4	3.25	17 25.7	28	1 54 7.55	0.247	10 7 41.9	1.98	15 26.4
29	1 51 27.81	0.674	10 0 46.6	3.09	17 22.0	29	1 54 1.25	0.278	10 6 52.4	2.15	15 22.4
30	1 51 43.64	0.646	10 1 58.9	2.93	17 18.3	30	1 53 54.19	0.310	10 5 58.9	2.32	15 18.3
31	1 51 58.79	+ 0.618	+ 10 3 7.3	+ 2.77	17 14.6	31	1 53 46.38	- 0.341	+ 10 5 1.4	- 2.49	15 14.3
32	1 52 13.27	+ 0.589	+ 10 4 11.9	+ 2.61	17 10.9	32	1 53 37.82	- 0.373	+ 10 3 59.9	- 2.65	15 10.2
Day of the Month.		4th.	12th.	20th.	28th.	Day of the Month.		5th.	13th.	21st.	29th.
Semidiameter . . . .		18.41	18.85	19.32	19.82	Semidiameter . . . .		20.33	20.85	21.38	21.90
Horizontal Parallax . .		1.72	1.76	1.81	1.85	Horizontal Parallax . .		1.90	1.95	2.00	2.05

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign — indicates that north declinations are decreasing or south declinations increasing.

## GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.										
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.					
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.						
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m					
1	1 53 37.82	-0.373	+10 3 59.9	-2.65	15 10.2	1	1 44 8.87	-1.131	+9 5 45.6	-6.63	13 2.6					
2	1 53 28.50	0.404	10 2 54.3	2.81	15 6.1	2	1 43 41.51	1.147	9 3 5.4	6.71	12 58.2					
3	1 53 18.44	0.435	10 1 44.8	2.98	15 1.9	3	1 43 13.77	1.162	9 0 23.5	6.79	12 53.8					
4	1 53 7.64	0.466	10 0 31.4	3.14	14 57.8	4	1 42 45.68	1.177	8 57 39.8	6.86	12 49.4					
5	1 52 56.11	0.496	9 59 14.1	3.31	14 53.7	5	1 42 17.25	1.191	8 54 54.3	6.92	12 45.0					
6	1 52 43.84	-0.526	+ 9 57 52.8	-3.47	14 49.6	6	1 41 48.51	-1.204	+8 52 7.3	-6.98	12 40.6					
7	1 52 30.85	0.556	9 56 27.7	3.63	14 45.4	7	1 41 19.49	1.215	8 49 19.0	7.04	12 36.2					
8	1 52 17.14	0.586	9 54 58.8	3.79	14 41.3	8	1 40 50.20	1.226	8 46 29.4	7.09	12 31.8					
9	1 52 2.72	0.616	9 53 26.2	3.94	14 37.1	9	1 40 20.66	1.236	8 43 38.6	7.13	12 27.4					
10	1 51 47.59	0.645	9 51 49.9	4.09	14 32.9	10	1 39 50.90	1.245	8 40 46.8	7.17	12 23.0					
11	1 51 31.77	-0.674	+ 9 50 9.9	-4.24	14 28.7	11	1 39 20.95	-1.252	+8 37 54.1	-7.21	12 18.5					
12	1 51 15.27	0.702	9 48 26.3	4.39	14 24.5	12	1 38 50.84	1.258	8 35 0.8	7.24	12 14.1					
13	1 50 58.10	0.730	9 46 39.2	4.54	14 20.3	13	1 38 20.58	1.263	8 32 6.8	7.26	12 9.6					
14	1 50 40.28	0.757	9 44 48.5	4.68	14 16.1	14	1 37 50.19	1.268	8 29 12.4	7.28	12 5.2					
15	1 50 21.80	0.784	9 42 54.4	4.82	14 11.8	15	1 37 19.70	1.272	8 26 17.7	7.29	12 0.7					
16	1 50 2.68	-0.810	+ 9 40 57.0	-4.96	14 7.6	16	1 36 49.13	-1.275	+8 23 22.8	-7.29	11 56.3					
17	1 49 42.94	0.836	9 38 56.4	5.10	14 3.3	17	1 36 18.51	1.277	8 20 27.9	7.29	11 51.8					
18	1 49 22.58	0.861	9 36 52.5	5.23	13 59.0	18	1 35 47.86	1.277	8 17 33.1	7.28	11 47.4					
19	1 49 1.63	0.885	9 34 45.5	5.36	13 54.7	19	1 35 17.22	1.277	8 14 38.5	7.27	11 42.9					
20	1 48 40.10	0.909	9 32 35.4	5.48	13 50.4	20	1 34 46.60	1.275	8 11 44.1	7.25	11 38.5					
21	1 48 18.00	-0.932	+ 9 30 22.3	-5.60	13 46.1	21	1 34 16.01	-1.275	+8 8 50.3	-7.22	11 34.0					
22	1 47 55.34	0.955	9 28 6.3	5.72	13 41.8	22	1 33 45.49	1.270	8 5 57.2	7.19	11 29.6					
23	1 47 32.14	0.977	9 25 47.5	5.84	13 37.5	23	1 33 15.06	1.266	8 3 4.9	7.16	11 25.2					
24	1 47 8.41	0.999	9 23 25.9	5.95	13 33.2	24	1 32 44.74	1.261	8 0 13.6	7.12	11 20.8					
25	1 46 44.17	1.020	9 21 1.7	6.06	13 28.8	25	1 32 14.55	1.255	7 57 23.2	7.07	11 16.3					
26	1 46 19.43	-1.041	+ 9 18 34.9	-6.17	13 24.5	26	1 31 44.52	-1.248	+7 54 34.0	-7.02	11 11.9					
27	1 45 54.21	1.060	9 16 5.6	6.27	13 20.1	27	1 31 14.66	1.240	7 51 46.1	6.96	11 7.5					
28	1 45 28.53	1.079	9 13 33.9	6.37	13 15.7	28	1 30 45.00	1.231	7 48 59.7	6.90	11 3.1					
29	1 45 2.40	1.097	9 11 0.0	6.46	13 11.3	29	1 30 15.56	1.221	7 46 14.8	6.83	10 58.7					
30	1 44 35.84	1.115	9 8 23.8	6.55	13 7.0	30	1 29 46.36	1.210	7 43 31.6	6.76	10 54.3					
31	1 44 8.87	-1.131	+ 9 5 45.6	-6.63	13 2.6	31	1 29 17.43	-1.199	+7 40 50.3	-6.68	10 49.9					
32	1 43 41.51	-1.147	+ 9 3 5.4	-6.71	12 58.2	32	1 28 48.78	-1.187	+7 38 10.9	-6.60	10 45.5					
Day of the Month.					6th.	14th.	22d.	30th.	Day of the Month.					8th.	16th.	24th.
Semidiameter . . . . .					22.39	22.82	23.20	23.49	Semidiameter . . . . .					23.68	23.76	23.71
Horizontal Parallax . . . . .					2.09	2.13	2.17	2.20	Horizontal Parallax . . . . .					2.21	2.22	2.22

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

## GREENWICH MEAN TIME.

NOVEMBER.						DECEMBER.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	1 28 48.78	-1.187	+7 38 10.9	-6.60	10 45.5	1	1 18 16.67	-0.480	+6 42 50.6	-2.11	8 37.1
2	1 28 20.44	1.174	7 35 33.6	6.51	10 41.1	2	1 18 5.52	0.449	6 42 2.4	1.92	8 33.0
3	1 27 52.43	1.160	7 32 58.5	6.41	10 36.7	3	1 17 55.11	0.418	6 41 18.8	1.72	8 28.9
4	1 27 24.77	1.145	7 30 25.7	6.31	10 32.3	4	1 17 45.46	0.387	6 40 39.9	1.53	8 24.8
5	1 26 57.48	1.128	7 27 55.4	6.21	10 27.9	5	1 17 36.57	0.355	6 40 5.7	1.34	8 20.8
6	1 26 30.60	-1.111	+7 25 27.7	-6.10	10 23.5	6	1 17 28.44	-0.323	+6 39 36.2	-1.14	8 16.7
7	1 26 4.13	1.093	7 23 2.7	5.98	10 19.2	7	1 17 21.06	0.291	6 39 11.3	0.94	8 12.7
8	1 25 38.09	1.075	7 20 40.5	5.86	10 14.8	8	1 17 14.47	0.259	6 38 51.3	0.74	8 8.6
9	1 25 12.51	1.056	7 18 21.3	5.74	10 10.5	9	1 17 8.66	0.227	6 38 36.0	0.54	8 4.6
10	1 24 47.41	1.036	7 16 5.2	5.61	10 6.1	10	1 17 3.63	0.194	6 38 25.5	0.34	8 0.6
11	1 24 22.80	-1.015	+7 13 52.2	-5.47	10 1.8	11	1 16 59.37	-0.161	+6 38 19.8	-0.14	7 56.6
12	1 23 58.71	0.993	7 11 42.5	5.33	9 57.4	12	1 16 55.91	0.129	6 38 18.9	+0.06	7 52.6
13	1 23 35.14	0.971	7 9 36.2	5.19	9 53.1	13	1 16 53.23	0.096	6 38 22.8	0.26	7 48.6
14	1 23 12.12	0.948	7 7 33.4	5.04	9 48.8	14	1 16 51.33	0.064	6 38 31.5	0.46	7 44.6
15	1 22 49.66	0.924	7 5 34.2	4.89	9 44.5	15	1 16 50.20	-0.031	6 38 44.9	0.66	7 40.7
16	1 22 27.78	-0.900	+7 3 38.6	-4.74	9 40.2	16	1 16 49.86	+0.002	+6 39 3.1	+0.86	7 36.8
17	1 22 6.48	0.875	7 1 46.6	4.59	9 35.9	17	1 16 50.30	0.035	6 39 26.1	1.06	7 32.9
18	1 21 45.79	0.850	6 59 58.5	4.43	9 31.6	18	1 16 51.53	0.068	6 39 53.8	1.26	7 29.0
19	1 21 25.71	0.824	6 58 14.3	4.26	9 27.4	19	1 16 53.54	0.100	6 40 26.2	1.45	7 25.1
20	1 21 6.26	0.797	6 56 34.1	4.09	9 23.1	20	1 16 56.33	0.132	6 41 3.4	1.65	7 21.2
21	1 20 47.45	-0.770	+6 54 57.9	-3.92	9 18.9	21	1 16 59.88	+0.164	+6 41 45.2	+1.84	7 17.3
22	1 20 29.29	0.743	6 53 25.8	3.75	9 14.7	22	1 17 4.20	0.196	6 42 31.6	2.03	7 13.4
23	1 20 11.79	0.716	6 51 57.9	3.58	9 10.5	23	1 17 9.29	0.228	6 43 22.6	2.22	7 9.6
24	1 19 54.96	0.688	6 50 34.2	3.40	9 6.3	24	1 17 15.14	0.260	6 44 18.3	2.41	7 5.8
25	1 19 38.81	0.659	6 49 14.8	3.22	9 2.1	25	1 17 21.75	0.292	6 45 18.5	2.60	7 2.0
26	1 19 23.35	-0.630	+6 47 59.7	-3.04	8 57.9	26	1 17 29.12	+0.323	+6 46 23.2	+2.79	6 58.2
27	1 19 8.59	0.601	6 46 49.0	2.86	8 53.7	27	1 17 37.25	0.354	6 47 32.5	2.98	6 54.4
28	1 18 54.53	0.571	6 45 42.7	2.68	8 49.5	28	1 17 46.13	0.386	6 48 46.3	3.17	6 50.6
29	1 18 41.18	0.541	6 44 40.8	2.49	8 45.4	29	1 17 55.76	0.417	6 50 4.5	3.36	6 46.8
30	1 18 28.56	0.511	6 43 43.4	2.30	8 41.2	30	1 18 6.14	0.448	6 51 27.1	3.54	6 43.0
31	1 18 16.67	-0.480	+6 42 50.6	-2.11	8 37.1	31	1 18 17.27	+0.479	+6 52 54.1	+3.72	6 39.3
32	1 18 5.52	-0.449	+6 42 2.4	-1.92	8 33.0	32	1 18 29.14	+0.510	+6 54 25.5	+3.90	6 35.6
Day of the Month.						Day of the Month.					
1st. 9th. 17th. 25th.						3d. 11th. 19th. 27th. 35th.					
Semidiameter . . . . . 23.56 23.30 22.94 22.51						Semidiameter . . . . . 22.01 21.49 20.94 20.39 19.85					
Horizontal Parallax . . . . . 2.20 2.18 2.15 2.10						Horizontal Parallax . . . . . 2.06 2.02 1.96 1.91 1.86					

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign — indicates that north declinations are decreasing or south declinations increasing.

## GREENWICH MEAN TIME.

JANUARY.						FEBRUARY.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	20 42 41.04	+ 1.125	-18 56 27.7	+ 4.19	2 3.4	1	20 57 22.47	+ 1.212	-17 59 49.5	+ 4.83	0 16.1
2	20 43 8.11	1.131	18 54 46.9	4.22	2 0.0	2	20 57 51.55	1.211	17 57 53.5	4.84	0 12.7
3	20 43 35.32	1.136	18 53 5.3	4.25	1 56.5	3	20 58 20.62	1.211	17 55 57.3	4.85	0 9.3
4	20 44 2.65	1.141	18 51 23.0	4.28	1 53.0	4	20 58 49.67	1.210	17 54 0.9	4.86	0 5.8
5	20 44 30.11	1.146	18 49 40.0	4.31	1 49.5	5	20 59 18.70	1.209	17 52 4.4	4.86	0 2.3
6	20 44 57.70	+ 1.151	-18 47 56.3	+ 4.34	1 46.1	6	20 59 47.71	+ 1.208	-17 50 7.7	+ 4.87	23 55.5
7	20 45 25.41	1.156	18 46 11.9	4.37	1 42.6	7	21 0 16.70	1.207	17 48 10.9	4.87	23 52.0
8	20 45 53.23	1.161	18 44 26.9	4.40	1 39.1	8	21 0 45.66	1.206	17 46 14.0	4.87	23 48.6
9	20 46 21.16	1.166	18 42 41.2	4.42	1 35.6	9	21 1 14.58	1.204	17 44 17.1	4.87	23 45.1
10	20 46 49.19	1.170	18 40 54.8	4.45	1 32.2	10	21 1 43.46	1.202	17 42 20.1	4.88	23 41.7
11	20 47 17.33	+ 1.174	-18 39 7.8	+ 4.48	1 28.7	11	21 2 12.30	+ 1.200	-17 40 23.0	+ 4.88	23 38.2
12	20 47 45.56	1.178	18 37 20.2	4.50	1 25.2	12	21 2 41.08	1.198	17 38 25.9	4.88	23 34.8
13	20 48 13.88	1.182	18 35 32.0	4.52	1 21.8	13	21 3 9.80	1.195	17 36 28.8	4.88	23 31.3
14	20 48 42.28	1.185	18 33 43.3	4.54	1 18.4	14	21 3 38.46	1.193	17 34 31.8	4.87	23 27.9
15	20 49 10.77	1.188	18 31 54.0	4.57	1 14.9	15	21 4 7.07	1.190	17 32 34.9	4.87	23 24.4
16	20 49 39.33	+ 1.191	-18 30 4.2	+ 4.59	1 11.4	16	21 4 35.60	+ 1.187	-17 30 38.0	+ 4.87	23 21.0
17	20 50 7.96	1.194	18 28 13.8	4.61	1 7.9	17	21 5 4.05	1.184	17 28 41.3	4.86	23 17.5
18	20 50 36.66	1.197	18 26 22.9	4.63	1 4.5	18	21 5 32.42	1.181	17 26 44.7	4.86	23 14.0
19	20 51 5.43	1.200	18 24 31.5	4.65	1 1.0	19	21 6 0.72	1.177	17 24 48.2	4.85	23 10.6
20	20 51 34.24	1.202	18 22 39.7	4.67	0 57.5	20	21 6 28.93	1.173	17 22 51.9	4.84	23 7.1
21	20 52 3.10	+ 1.204	-18 20 47.5	+ 4.69	0 54.1	21	21 6 57.03	+ 1.169	-17 20 55.8	+ 4.83	23 3.7
22	20 52 32.01	1.206	18 18 54.9	4.71	0 50.7	22	21 7 25.03	1.165	17 19 0.0	4.82	23 0.2
23	20 53 0.96	1.207	18 17 1.9	4.72	0 47.2	23	21 7 52.93	1.160	17 17 4.3	4.81	22 56.8
24	20 53 29.94	1.208	18 15 8.5	4.73	0 43.7	24	21 8 20.72	1.156	17 15 8.9	4.80	22 53.3
25	20 53 58.95	1.209	18 13 14.7	4.75	0 40.3	25	21 8 48.40	1.151	17 13 13.8	4.79	22 49.8
26	20 54 27.99	+ 1.210	-18 11 20.5	+ 4.77	0 36.9	26	21 9 15.97	+ 1.146	-17 11 19.0	+ 4.78	22 46.3
27	20 54 57.05	1.211	18 9 26.0	4.78	0 33.4	27	21 9 43.42	1.141	17 9 24.6	4.77	22 42.9
28	20 55 26.12	1.211	18 7 31.2	4.79	0 29.9	28	21 10 10.75	1.136	17 7 30.5	4.75	22 39.4
29	20 55 55.20	1.212	18 5 36.2	4.80	0 26.5	29	21 10 37.94	1.131	17 5 36.8	4.73	22 35.9
30	20 56 24.29	1.212	18 3 40.9	4.81	0 23.1	30	21 11 5.00	1.125	17 3 43.5	4.71	22 32.4
31	20 56 53.38	+ 1.212	-18 1 45.3	+ 4.82	0 19.6	31	21 11 31.93	+ 1.119	-17 1 50.5	+ 4.69	22 28.9
32	20 57 22.47	+ 1.212	-17 59 49.5	+ 4.83	0 16.1	32	21 11 58.72	+ 1.113	-16 59 58.0	+ 4.67	22 25.4

Day of the Month.	2d.	10th.	18th.	26th.	Day of the Month.	3d.	11th.	19th.	27th.
Semidiameter . . . . .	"	"	"	"	Semidiameter . . . . .	"	"	"	"
Horizontal Parallax . . . . .	7.24	7.21	7.18	7.16	Horizontal Parallax . . . . .	7.16	7.17	7.19	7.21
	0.81	0.81	0.81	0.81		0.81	0.81	0.81	0.81

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

## GREENWICH MEAN TIME.

MARCH.						APRIL.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	21 11 5.00	+1.125	-17 3 43.5	+4.71	22 32.4	1	21 23 36.56	+0.869	-16 10 31.3	+3.72	20 42.9
2	21 11 31.93	1.119	17 1 50.5	4.69	22 28.9	2	21 23 57.27	0.858	16 9 2.8	3.67	20 39.3
3	21 11 58.72	1.113	16 59 58.0	4.67	22 25.4	3	21 24 17.73	0.847	16 7 35.4	3.62	20 35.7
4	21 12 25.36	1.107	16 58 6.0	4.65	22 21.9	4	21 24 37.93	0.836	16 6 9.2	3.57	20 32.1
5	21 12 51.86	1.101	16 56 14.5	4.63	22 18.4	5	21 24 57.86	0.825	16 4 44.2	3.52	20 28.5
6	21 13 18.21	+1.095	-16 54 23.4	+4.61	22 14.9	6	21 25 17.51	+0.814	-16 3 20.4	+3.47	20 24.8
7	21 13 44.40	1.089	16 52 32.8	4.59	22 11.4	7	21 25 36.89	0.802	16 1 57.8	3.42	20 21.2
8	21 14 10.43	1.082	16 50 42.8	4.57	22 7.9	8	21 25 56.00	0.790	16 0 36.4	3.37	20 17.6
9	21 14 36.30	1.075	16 48 53.4	4.54	22 4.4	9	21 26 14.82	0.778	15 59 16.4	3.31	20 14.0
10	21 15 2.02	1.068	16 47 4.7	4.52	22 0.9	10	21 26 33.36	0.766	15 57 57.7	3.26	20 10.3
11	21 15 27.56	+1.061	-16 45 16.5	+4.50	21 57.4	11	21 26 51.61	+0.754	-15 56 40.3	+3.20	20 6.7
12	21 15 52.92	1.053	16 43 29.0	4.47	21 53.9	12	21 27 9.56	0.742	15 55 24.2	3.14	20 3.1
13	21 16 18.09	1.045	16 41 42.2	4.44	21 50.3	13	21 27 27.22	0.730	15 54 9.5	3.08	19 59.5
14	21 16 43.08	1.037	16 39 56.0	4.41	21 46.8	14	21 27 44.58	0.717	15 52 56.2	3.02	19 55.8
15	21 17 7.89	1.029	16 38 10.5	4.38	21 43.3	15	21 28 1.64	0.705	15 51 44.4	2.96	19 52.2
16	21 17 32.50	+1.021	-16 36 25.8	+4.35	21 39.8	16	21 28 18.39	+0.692	-15 50 33.9	+2.90	19 48.5
17	21 17 56.91	1.013	16 34 41.9	4.32	21 36.2	17	21 28 34.83	0.679	15 49 24.9	2.84	19 44.9
18	21 18 21.11	1.005	16 32 58.8	4.28	21 32.7	18	21 28 50.95	0.666	15 48 17.4	2.78	19 41.2
19	21 18 45.11	0.996	16 31 16.4	4.25	21 29.2	19	21 29 6.76	0.653	15 47 11.4	2.72	19 37.5
20	21 19 8.90	0.987	16 29 34.9	4.21	21 25.7	20	21 29 22.25	0.640	15 46 6.9	2.66	19 33.8
21	21 19 32.47	+0.978	-16 27 54.3	+4.18	21 22.1	21	21 29 37.42	+0.626	-15 45 3.9	+2.60	19 30.1
22	21 19 55.83	0.969	16 26 14.6	4.14	21 18.6	22	21 29 52.26	0.612	15 44 2.4	2.54	19 26.4
23	21 20 18.96	0.960	16 24 35.8	4.10	21 15.0	23	21 30 6.77	0.598	15 43 2.5	2.47	19 22.7
24	21 20 41.86	0.950	16 22 58.0	4.06	21 11.5	24	21 30 20.95	0.584	15 42 4.2	2.40	19 19.0
25	21 21 4.54	0.940	16 21 21.1	4.02	21 7.9	25	21 30 34.80	0.570	15 41 7.5	2.34	19 15.3
26	21 21 26.99	+0.930	-16 19 45.1	+3.98	21 4.4	26	21 30 48.32	+0.556	-15 40 12.3	+2.27	19 11.6
27	21 21 49.19	0.920	16 18 10.2	3.94	21 0.8	27	21 31 1.50	0.542	15 39 18.7	2.20	19 7.9
28	21 22 11.15	0.910	16 16 36.3	3.90	20 57.2	28	21 31 14.35	0.528	15 38 26.8	2.13	19 4.2
29	21 22 32.87	0.900	16 15 3.5	3.85	20 53.6	29	21 31 26.85	0.514	15 37 36.5	2.06	19 0.5
30	21 22 54.36	0.890	16 13 31.7	3.80	20 50.1	30	21 31 39.00	0.500	15 36 47.9	1.99	18 56.7
31	21 23 15.59	+0.880	-16 12 0.9	+3.76	20 46.5	31	21 31 50.81	+0.486	-15 36 1.0	+1.92	18 53.0
32	21 23 36.56	+0.869	-16 10 31.3	+3.72	20 42.9	32	21 32 2.28	+0.471	-15 35 15.8	+1.85	18 49.2
Day of the Month.						Day of the Month.					
			6th.	14th.	22d.				7th.	15th.	23d.
Semidiameter			7.26	7.31	7.37	Semidiameter			7.52	7.60	7.69
Horizontal Parallax			0.82	0.82	0.83	Horizontal Parallax			0.85	0.86	0.87

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign - indicates that north declinations are decreasing or south declinations increasing.

## GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	21 31 50.81	+ 0.486	- 15 36 1.0	+ 1.92	18 53.0	1	21 34 54.36	+ 0.001	- 15 26 42.0	- 0.46	16 54.0
2	21 32 2.28	0.471	15 35 15.8	1.85	18 49.2	2	21 34 54.21	- 0.015	15 26 53.9	0.54	16 50.0
3	21 32 13.39	0.456	15 34 32.3	1.78	18 45.5	3	21 34 53.67	0.031	15 27 7.7	0.61	16 46.1
4	21 32 24.15	0.441	15 33 50.5	1.71	18 41.7	4	21 34 52.74	0.047	15 27 23.3	0.69	16 42.1
5	21 32 34.55	0.426	15 33 10.4	1.64	18 38.0	5	21 34 51.43	0.063	15 27 40.8	0.77	16 38.2
6	21 32 44.59	+ 0.411	- 15 32 32.1	+ 1.57	18 34.2	6	21 34 49.74	- 0.079	- 15 28 0.2	- 0.85	16 34.2
7	21 32 54.27	0.396	15 31 55.6	1.50	18 30.4	7	21 34 47.66	0.095	15 28 21.4	0.93	16 30.2
8	21 33 3.59	0.381	15 31 20.8	1.42	18 26.6	8	21 34 45.19	0.111	15 28 44.5	1.00	16 26.3
9	21 33 12.56	0.366	15 30 47.8	1.34	18 22.8	9	21 34 42.34	0.127	15 29 9.5	1.08	16 22.3
10	21 33 21.15	0.351	15 30 16.6	1.27	18 19.0	10	21 34 39.10	0.143	15 29 36.3	1.16	16 18.3
11	21 33 29.37	+ 0.336	- 15 29 47.2	+ 1.20	18 15.2	11	21 34 35.50	- 0.159	- 15 30 4.9	- 1.24	16 14.3
12	21 33 37.22	0.320	15 29 19.7	1.12	18 11.4	12	21 34 31.52	0.174	15 30 35.3	1.31	16 10.3
13	21 33 44.70	0.304	15 28 54.0	1.04	18 7.6	13	21 34 27.17	0.189	15 31 7.5	1.38	16 6.3
14	21 33 51.80	0.288	15 28 30.1	0.96	18 3.8	14	21 34 22.45	0.205	15 31 41.5	1.46	16 2.3
15	21 33 58.52	0.273	15 28 8.1	0.88	17 59.9	15	21 34 17.35	0.220	15 32 17.3	1.53	15 58.2
16	21 34 4.86	+ 0.257	- 15 27 48.0	+ 0.80	17 56.1	16	21 34 11.89	- 0.235	- 15 32 54.8	- 1.60	15 54.2
17	21 34 10.83	0.241	15 27 29.8	0.72	17 52.3	17	21 34 6.06	0.250	15 33 34.0	1.67	15 50.2
18	21 34 16.41	0.225	15 27 13.4	0.64	17 48.4	18	21 33 59.87	0.265	15 34 15.0	1.74	15 46.1
19	21 34 21.61	0.209	15 26 58.9	0.56	17 44.6	19	21 33 53.32	0.280	15 34 57.7	1.81	15 42.1
20	21 34 26.43	0.193	15 26 46.3	0.48	17 40.7	20	21 33 46.42	0.295	15 35 42.0	1.88	15 38.0
21	21 34 30.87	+ 0.177	- 15 26 35.6	+ 0.40	17 36.9	21	21 33 39.17	- 0.310	- 15 36 28.0	- 1.95	15 34.0
22	21 34 34.92	0.161	15 26 26.8	0.32	17 33.0	22	21 33 31.56	0.324	15 37 15.6	2.02	15 29.9
23	21 34 38.59	0.145	15 26 19.8	0.24	17 29.1	23	21 33 23.61	0.338	15 38 4.8	2.08	15 25.9
24	21 34 41.88	0.129	15 26 14.7	0.17	17 25.2	24	21 33 15.32	0.352	15 38 55.6	2.15	15 21.8
25	21 34 44.78	0.113	15 26 11.5	0.09	17 21.4	25	21 33 6.70	0.366	15 39 47.9	2.22	15 17.7
26	21 34 47.30	+ 0.097	- 15 26 10.2	+ 0.01	17 17.5	26	21 32 57.74	- 0.380	- 15 40 41.8	- 2.28	15 13.6
27	21 34 49.44	0.081	15 26 10.8	- 0.07	17 13.6	27	21 32 48.45	0.394	15 41 37.2	2.34	15 9.6
28	21 34 51.19	0.065	15 26 13.3	0.15	17 9.7	28	21 32 38.84	0.407	15 42 34.1	2.40	15 5.5
29	21 34 52.56	0.049	15 26 17.6	0.22	17 5.7	29	21 32 28.91	0.420	15 43 32.4	2.46	15 1.4
30	21 34 53.54	0.033	15 26 23.9	0.30	17 1.8	30	21 32 18.66	0.433	15 44 32.2	2.52	14 57.2
31	21 34 54.14	+ 0.017	- 15 26 32.0	- 0.38	16 57.9	31	21 32 8.09	- 0.446	- 15 45 33.5	- 2.58	14 53.1
32	21 34 54.36	+ 0.001	- 15 26 42.0	- 0.46	16 54.0	32	21 31 57.22	- 0.459	- 15 46 36.1	- 2.64	14 49.0

Day of the Month.	1st.	9th.	17th.	25th.	Day of the Month.	2d.	10th.	18th.	26th.
Semidiameter . . . . .	7.79	7.89	8.00	8.11	Semidiameter . . . . .	8.22	8.33	8.43	8.53
Horizontal Parallax . . . . .	0.88	0.89	0.90	0.91	Horizontal Parallax . . . . .	0.93	0.94	0.95	0.96

NOTE.—The sign + indicates north declinations; the sign - indicates south declinations.

## GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	21 32 8.09	-0.446	15 45 33.5	-2.58	14 53.1	1	21 24 36.45	-0.719	16 25 46.8	-3.64	12 43.7
2	21 31 57.22	0.459	15 46 36.1	2.64	14 49.0	2	21 24 19.14	0.723	16 27 14.4	3.65	12 39.5
3	21 31 46.04	0.472	15 47 40.0	2.69	14 44.9	3	21 24 1.75	0.726	16 28 42.1	3.65	12 35.3
4	21 31 34.55	0.484	15 48 45.3	2.75	14 40.8	4	21 23 44.28	0.729	16 30 9.9	3.66	12 31.0
5	21 31 22.77	0.496	15 49 51.9	2.80	14 36.6	5	21 23 26.73	0.732	16 31 37.9	3.66	12 26.8
6	21 31 10.71	-0.508	15 50 59.7	-2.85	14 32.5	6	21 23 9.12	-0.734	16 33 5.9	-3.66	12 22.6
7	21 30 58.36	0.520	15 52 8.8	2.90	14 28.4	7	21 22 51.47	0.736	16 34 33.8	3.66	12 18.4
8	21 30 45.72	0.532	15 53 19.1	2.95	14 24.2	8	21 22 33.78	0.737	16 36 1.6	3.65	12 14.1
9	21 30 32.81	0.543	15 54 30.6	3.00	14 20.1	9	21 22 16.06	0.738	16 37 29.3	3.65	12 9.9
10	21 30 19.64	0.554	15 55 43.2	3.05	14 15.9	10	21 21 58.31	0.738	16 38 56.9	3.64	12 5.7
11	21 30 6.21	-0.565	15 56 56.9	-3.09	14 11.8	11	21 21 40.56	-0.739	16 40 24.2	-3.63	12 1.5
12	21 29 52.51	0.576	15 58 11.6	3.13	14 7.6	12	21 21 22.81	0.739	16 41 51.3	3.62	11 57.2
13	21 29 38.56	0.586	15 59 27.3	3.17	14 3.4	13	21 21 5.06	0.738	16 43 18.1	3.61	11 53.0
14	21 29 24.38	0.596	16 0 44.0	3.21	13 59.3	14	21 20 47.32	0.737	16 44 44.6	3.60	11 48.8
15	21 29 9.96	0.605	16 2 1.7	3.25	13 55.1	15	21 20 29.62	0.736	16 46 10.6	3.58	11 44.5
16	21 28 55.31	-0.614	16 3 20.4	-3.29	13 50.9	16	21 20 11.96	-0.735	16 47 36.2	-3.56	11 40.3
17	21 28 40.44	0.623	16 4 39.8	3.33	13 46.7	17	21 19 54.35	0.733	16 49 1.4	3.54	11 36.1
18	21 28 25.37	0.632	16 6 0.0	3.36	13 42.6	18	21 19 36.79	0.730	16 50 26.1	3.52	11 31.9
19	21 28 10.09	0.640	16 7 21.0	3.39	13 38.4	19	21 19 19.30	0.727	16 51 50.2	3.50	11 27.7
20	21 27 54.61	0.648	16 8 42.9	3.42	13 34.2	20	21 19 1.88	0.724	16 53 13.7	3.47	11 23.4
21	21 27 38.94	-0.656	16 10 5.4	-3.45	13 30.0	21	21 18 44.54	-0.720	16 54 36.5	-3.44	11 19.2
22	21 27 23.10	0.664	16 11 28.5	3.48	13 25.8	22	21 18 27.30	0.716	16 55 58.7	3.41	11 15.0
23	21 27 7.10	0.671	16 12 52.2	3.50	13 21.6	23	21 18 10.16	0.711	16 57 20.2	3.38	11 10.8
24	21 26 50.91	0.677	16 14 16.6	3.52	13 17.4	24	21 17 53.13	0.706	16 58 40.9	3.35	11 6.6
25	21 26 34.57	0.683	16 15 41.5	3.54	13 13.2	25	21 17 36.21	0.701	17 0 0.9	3.32	11 2.4
26	21 26 18.09	-0.689	16 17 6.8	-3.56	13 9.0	26	21 17 19.42	-0.696	17 1 20.0	-3.28	10 58.2
27	21 26 1.46	0.695	16 18 32.6	3.58	13 4.8	27	21 17 2.77	0.691	17 2 38.3	3.24	10 53.9
28	21 25 44.69	0.701	16 19 58.8	3.60	13 0.6	28	21 16 46.26	0.685	17 3 55.7	3.20	10 49.7
29	21 25 27.79	0.706	16 21 25.4	3.61	12 56.3	29	21 16 29.89	0.678	17 5 12.2	3.16	10 45.5
30	21 25 10.78	0.711	16 22 52.3	3.62	12 52.1	30	21 16 13.69	0.671	17 6 27.8	3.12	10 41.4
31	21 24 53.67	-0.715	16 24 19.4	-3.63	12 47.9	31	21 15 57.66	-0.664	17 7 42.3	-3.08	10 37.2
32	21 24 36.45	-0.719	16 25 46.8	-3.64	12 43.7	32	21 15 41.80	-0.657	17 8 55.7	-3.04	10 33.0
Day of the Month.		4th.	12th.	20th.	28th.	Day of the Month.		5th.	13th.	21st.	29th.
Semidiameter		8.61	8.68	8.73	8.77	Semidiameter		8.80	8.81	8.79	8.75
Horizontal Parallax		0.97	0.98	0.98	0.99	Horizontal Parallax		0.99	0.99	0.99	0.99

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign - indicates that north declinations are decreasing or south declinations increasing.

## GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	21 15 41.80	-0.657	-17 8 55.7	-3.04	10 33.0	1	21 9 45.29	-0.295	-17 35 19.9	-1.22	8 29.2
2	21 15 26.12	0.649	17 10 8.1	3.00	10 28.8	2	21 9 38.40	0.280	17 35 48.4	1.15	8 25.1
3	21 15 10.63	0.641	17 11 19.5	2.95	10 24.6	3	21 9 31.88	0.265	17 36 15.2	1.08	8 21.1
4	21 14 55.35	0.632	17 12 29.7	2.90	10 20.4	4	21 9 25.74	0.250	17 36 40.3	1.01	8 17.1
5	21 14 40.28	0.623	17 13 38.7	2.85	10 16.2	5	21 9 19.98	0.234	17 37 3.7	0.94	8 13.0
6	21 14 25.41	-0.614	-17 14 46.5	-2.80	10 12.0	6	21 9 14.60	-0.218	-17 37 25.3	-0.86	8 9.0
7	21 14 10.77	0.604	17 15 53.1	2.75	10 7.9	7	21 9 9.61	0.202	17 37 45.1	0.79	8 5.0
8	21 13 56.37	0.594	17 16 58.5	2.70	10 3.7	8	21 9 5.00	0.185	17 38 3.0	0.72	8 1.0
9	21 13 42.21	0.584	17 18 2.6	2.65	9 59.5	9	21 9 0.79	0.168	17 38 19.2	0.65	7 57.0
10	21 13 28.30	0.574	17 19 5.4	2.59	9 55.4	10	21 8 56.98	0.151	17 38 33.6	0.57	7 53.0
11	21 13 14.64	-0.563	-17 20 6.8	-2.53	9 51.2	11	21 8 53.57	-0.134	-17 38 46.2	-0.49	7 49.0
12	21 13 1.26	0.552	17 21 6.8	2.47	9 47.1	12	21 8 50.56	0.117	17 38 57.0	0.42	7 45.0
13	21 12 48.15	0.541	17 22 5.5	2.41	9 42.9	13	21 8 47.95	0.100	17 39 6.0	0.34	7 41.1
14	21 12 35.31	0.529	17 23 2.8	2.35	9 38.8	14	21 8 45.75	0.083	17 39 13.2	0.27	7 37.1
15	21 12 22.76	0.517	17 23 58.6	2.29	9 34.6	15	21 8 43.96	0.066	17 39 18.5	0.19	7 33.1
16	21 12 10.50	-0.505	-17 24 52.9	-2.23	9 30.5	16	21 8 42.57	-0.049	-17 39 22.0	-0.11	7 29.2
17	21 11 58.54	0.492	17 25 45.7	2.17	9 26.4	17	21 8 41.59	0.032	17 39 23.7	-0.03	7 25.2
18	21 11 46.89	0.479	17 26 37.1	2.11	9 22.3	18	21 8 41.02	-0.015	17 39 23.6	+0.05	7 21.3
19	21 11 35.54	0.466	17 27 27.0	2.05	9 18.1	19	21 8 40.85	+0.002	17 39 21.7	0.12	7 17.4
20	21 11 24.51	0.453	17 28 15.3	1.98	9 14.0	20	21 8 41.09	0.019	17 39 18.0	0.20	7 13.4
21	21 11 13.80	-0.440	-17 29 2.0	-1.91	9 9.9	21	21 8 41.74	+0.036	-17 39 12.5	+0.27	7 9.5
22	21 11 3.41	0.426	17 29 47.0	1.85	9 5.8	22	21 8 42.80	0.053	17 39 5.2	0.35	7 5.6
23	21 10 53.35	0.412	17 30 30.5	1.79	9 1.7	23	21 8 44.27	0.070	17 38 56.0	0.43	7 1.7
24	21 10 43.63	0.398	17 31 12.4	1.72	8 57.6	24	21 8 46.14	0.087	17 38 45.0	0.51	6 57.8
25	21 10 34.25	0.384	17 31 52.7	1.65	8 53.5	25	21 8 48.42	0.104	17 38 32.2	0.58	6 53.9
26	21 10 25.20	-0.370	-17 32 31.5	-1.58	8 49.5	26	21 8 51.11	+0.121	-17 38 17.6	+0.65	6 50.0
27	21 10 16.50	0.355	17 33 8.5	1.51	8 45.4	27	21 8 54.21	0.138	17 38 1.2	0.73	6 46.2
28	21 10 8.16	0.340	17 33 43.9	1.44	8 41.3	28	21 8 57.72	0.155	17 37 43.0	0.81	6 42.3
29	21 10 0.18	0.325	17 34 17.6	1.37	8 37.3	29	21 9 1.63	0.172	17 37 23.0	0.88	6 38.4
30	21 9 52.55	0.310	17 34 49.6	1.30	8 33.2	30	21 9 5.95	0.189	17 37 1.2	0.95	6 34.6
31	21 9 45.29	-0.295	-17 35 19.9	-1.22	8 29.2	31	21 9 10.68	+0.205	-17 36 37.6	+1.02	6 30.7
32	21 9 38.40	-0.280	-17 35 48.4	-1.15	8 25.1	32	21 9 15.81	+0.222	-17 36 12.2	+1.10	6 26.8
Day of the Month.		6th.	14th.	22d.	30th.	Day of the Month.		8th.	16th.	24th.	
Semidiameter . . . . .		8.70	8.63	8.55	8.47	Semidiameter . . . . .		8.37	8.26	8.15	
Horizontal Parallax . . . . .		0.98	0.97	0.96	0.95	Horizontal Parallax . . . . .		0.94	0.93	0.92	

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.



## GREENWICH MEAN TIME.

NOVEMBER.						DECEMBER.												
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.							
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.								
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m							
1	21 9 15.81	+ 0.222	- 17 36 12.2	+ 1.10	6 26.8	1	21 14 49.48	+ 0.687	- 17 10 11.8	+ 3.18	4 34.5							
2	21 9 21.35	0.239	17 35 45.0	1.18	6 23.0	2	21 15 6.13	0.701	17 8 54.8	3.24	4 30.8							
3	21 9 27.29	0.256	17 35 16.0	1.25	6 19.2	3	21 15 23.10	0.714	17 7 36.3	3.30	4 27.2							
4	21 9 33.63	0.273	17 34 45.3	1.32	6 15.4	4	21 15 40.39	0.727	17 6 16.3	3.36	4 23.5							
5	21 9 40.38	0.290	17 34 12.8	1.39	6 11.5	5	21 15 57.99	0.740	17 4 54.9	3.42	4 19.9							
6	21 9 47.53	+ 0.307	- 17 33 38.4	+ 1.47	6 7.7	6	21 16 15.91	+ 0.753	- 17 3 32.0	+ 3.48	4 16.2							
7	21 9 55.08	0.324	17 33 2.3	1.55	6 3.9	7	21 16 34.14	0.766	17 2 7.6	3.54	4 12.6							
8	21 10 3.03	0.340	17 32 24.5	1.62	6 0.1	8	21 16 52.67	0.779	17 0 41.8	3.60	4 9.0							
9	21 10 11.37	0.356	17 31 45.0	1.69	5 56.3	9	21 17 11.49	0.791	16 59 14.6	3.66	4 5.4							
10	21 10 20.11	0.372	17 31 3.7	1.76	5 52.6	10	21 17 30.61	0.803	16 57 46.0	3.72	4 1.8							
11	21 10 29.24	+ 0.388	- 17 30 20.6	+ 1.83	5 48.8	11	21 17 50.02	+ 0.815	- 16 56 16.1	+ 3.78	3 58.2							
12	21 10 38.76	0.404	17 29 35.8	1.90	5 45.0	12	21 18 9.71	0.827	16 54 44.8	3.84	3 54.6							
13	21 10 48.67	0.420	17 28 49.3	1.97	5 41.2	13	21 18 29.68	0.838	16 53 12.1	3.90	3 51.0							
14	21 10 58.96	0.436	17 28 1.1	2.04	5 37.5	14	21 18 49.93	0.849	16 51 38.1	3.95	3 47.4							
15	21 11 9.63	0.452	17 27 11.2	2.11	5 33.7	15	21 19 10.45	0.860	16 50 2.8	4.00	3 43.8							
16	21 11 20.68	+ 0.468	- 17 26 19.6	+ 2.18	5 30.0	16	21 19 31.23	+ 0.871	- 16 48 26.3	+ 4.06	3 40.2							
17	21 11 32.10	0.484	17 25 26.4	2.25	5 26.2	17	21 19 52.27	0.882	16 46 48.5	4.11	3 36.6							
18	21 11 43.90	0.499	17 24 31.5	2.32	5 22.5	18	21 20 13.57	0.893	16 45 9.3	4.16	3 33.0							
19	21 11 56.06	0.514	17 23 35.0	2.39	5 18.7	19	21 20 35.14	0.903	16 43 28.8	4.21	3 29.5							
20	21 12 8.58	0.529	17 22 36.8	2.46	5 15.0	20	21 20 56.94	0.913	16 41 47.1	4.26	3 25.9							
21	21 12 21.46	+ 0.544	- 17 21 37.0	+ 2.53	5 11.3	21	21 21 18.98	+ 0.923	- 16 40 4.3	+ 4.31	3 22.3							
22	21 12 34.70	0.559	17 20 35.6	2.60	5 7.6	22	21 21 41.26	0.933	16 38 20.3	4.36	3 18.7							
23	21 12 48.30	0.574	17 19 32.6	2.67	5 3.9	23	21 22 3.79	0.943	16 36 35.1	4.41	3 15.2							
24	21 13 2.25	0.589	17 18 28.0	2.73	5 0.2	24	21 22 26.54	0.953	16 34 48.7	4.46	3 11.6							
25	21 13 16.55	0.603	17 17 21.7	2.79	4 56.5	25	21 22 49.51	0.962	16 33 1.2	4.50	3 8.1							
26	21 13 31.19	+ 0.617	- 17 16 13.9	+ 2.86	4 52.8	26	21 23 12.70	+ 0.971	- 16 31 12.6	+ 4.55	3 4.5							
27	21 13 46.17	0.631	17 15 4.6	2.93	4 49.1	27	21 23 36.11	0.980	16 29 22.8	4.60	3 1.0							
28	21 14 1.49	0.645	17 13 53.7	2.99	4 45.4	28	21 23 59.74	0.989	16 27 31.9	4.65	2 57.4							
29	21 14 17.16	0.659	17 12 41.3	3.05	4 41.8	29	21 24 23.57	0.998	16 25 39.9	4.69	2 53.9							
30	21 14 33.16	0.673	17 11 27.3	3.11	4 38.1	30	21 24 47.60	1.006	16 23 46.8	4.73	2 50.4							
31	21 14 49.48	+ 0.687	- 17 10 11.8	+ 3.18	4 34.5	31	21 25 11.84	+ 1.014	- 16 21 52.7	+ 4.77	2 46.9							
32	21 15 6.13	+ 0.701	- 17 8 54.8	+ 3.24	4 30.8	32	21 25 36.28	+ 1.022	- 16 19 57.6	+ 4.82	2 43.3							
Day of the Month.					1st.	9th.	17th.	25th.	Day of the Month.					3d.	11th.	19th.	27th.	35th.
Semidiameter . . . . .					8.04	7.93	7.83	7.73	Semidiameter . . . . .					7.64	7.55	7.47	7.40	7.34
Horizontal Parallax . . . . .					0.91	0.89	0.88	0.87	Horizontal Parallax . . . . .					0.86	0.85	0.84	0.83	0.83

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign — indicates that north declinations are decreasing or south declinations increasing.

## GREENWICH MEAN TIME.

Month and Day.	Apparent Right Ascension.			Var. of R. A. for 1 Day.			Apparent Declination.			Var. of Decl. for 1 Day.			Meridian Passage.		
	Noon.			Noon.			Noon.			Noon.			Noon.		
	h	m	s	s	"	"	"	"	"	"	"	"	h	m	
Jan. 2	17	45	32.89	+15.510	-23	33	57.0	-6.00	22	59.2					
6	17	46	34.51	15.292	23	34	20.2	5.59	22	44.4					
10	17	47	35.16	15.025	23	34	41.7	5.17	22	29.7					
14	17	48	34.64	14.706	23	35	1.6	4.76	22	15.0					
18	17	49	32.74	14.332	23	35	19.8	4.36	22	0.2					
22	17	50	29.23	+13.906	-23	35	36.5	-3.97	21	45.5					
26	17	51	23.92	13.431	23	35	51.6	3.60	21	30.6					
30	17	52	16.61	12.910	23	36	5.3	3.26	21	15.7					
Feb. 3	17	53	7.14	12.350	23	36	17.7	2.94	21	0.8					
7	17	53	55.34	11.747	23	36	28.8	2.65	20	45.9					
11	17	54	41.05	+11.101	-23	36	38.9	-2.39	20	30.9					
15	17	55	24.09	10.412	23	36	47.9	2.15	20	15.9					
19	17	56	4.29	9.681	23	36	56.1	1.94	20	0.8					
23	17	56	41.50	8.918	23	37	3.4	1.74	19	45.7					
27	17	57	15.60	8.128	23	37	10.0	1.57	19	30.5					
Mar. 2	17	57	46.50	+7.315	-23	37	16.0	-1.45	19	15.3					
6	17	58	14.09	6.476	23	37	21.6	1.35	19	0.0					
10	17	58	38.28	5.615	23	37	26.9	1.29	18	44.7					
14	17	58	58.98	4.732	23	37	31.9	1.23	18	29.3					
18	17	59	16.11	3.830	23	37	36.7	1.19	18	13.9					
22	17	59	29.61	+2.920	-23	37	41.4	-1.16	17	58.4					
26	17	59	39.47	2.010	23	37	46.0	1.14	17	42.8					
30	17	59	45.69	1.099	23	37	50.5	1.13	17	27.1					
Apr. 3	17	59	48.27	+0.194	23	37	55.0	1.12	17	11.4					
7	17	59	47.25	-0.706	23	37	59.5	1.11	16	55.7					
11	17	59	42.63	-1.600	23	38	3.9	-1.10	16	39.9					
15	17	59	34.47	2.478	23	38	8.3	1.09	16	24.0					
19	17	59	22.83	3.336	23	38	12.6	1.05	16	8.1					
23	17	59	7.82	4.162	23	38	16.6	0.98	15	52.1					
27	17	58	49.58	4.952	23	38	20.4	0.90	15	36.0					
May 1	17	58	28.25	-5.708	-23	38	23.8	-0.81	15	19.9					
5	17	58	3.96	6.429	23	38	26.9	0.71	15	3.8					
9	17	57	36.87	7.109	23	38	29.5	0.57	14	47.6					
13	17	57	7.15	7.712	23	38	31.5	0.41	14	31.4					
17	17	56	35.01	8.320	23	38	32.8	0.24	14	15.1					
21	17	56	0.67	-8.838	-23	38	33.4	-0.04	13	58.8					
25	17	55	24.39	9.292	23	38	33.1	+0.19	13	42.5					
29	17	54	46.41	9.687	23	38	31.9	0.41	13	26.1					
June 2	17	54	6.97	10.023	23	38	29.8	0.64	13	9.7					
6	17	53	26.31	10.295	23	38	26.8	0.89	12	53.3					
10	17	52	44.70	-10.499	-23	38	22.8	+1.14	12	36.9					
14	17	52	2.43	10.627	23	38	17.7	1.39	12	20.5					
18	17	51	19.78	10.683	23	38	11.7	1.61	12	4.1					
22	17	50	37.06	10.665	23	38	4.8	1.84	11	57.6					
26	17	49	54.55	10.578	23	37	57.0	2.04	11	31.2					
30	17	49	12.52	-10.428	-23	37	48.5	+2.21	11	14.8					
July 4	17	48	31.23	-10.209	-23	37	39.3	+2.37	10	58.4					
July 4	17	48	31.23	-10.209	-23	37	39.3	+2.37	10	58.4					
8	17	47	50.94	9.924	23	37	29.5	2.50	10	42.0					
12	17	47	11.93	9.570	23	37	19.3	2.59	10	25.6					
16	17	46	34.47	9.149	23	37	8.8	2.64	10	9.3					
20	17	45	58.82	8.667	23	36	58.2	2.65	9	52.9					
24	17	45	25.21	-8.131	-23	36	47.6	+2.61	9	36.7					
28	17	44	53.84	7.547	23	36	37.3	2.54	9	20.4					
Aug. 1	17	44	24.90	6.914	23	36	27.3	2.44	9	4.2					
5	17	43	58.59	6.236	23	36	17.8	2.29	8	48.1					
9	17	43	35.07	5.515	23	36	9.0	2.10	8	32.0					
13	17	43	14.53	-4.749	-23	36	1.0	+1.86	8	15.9					
17	17	42	57.12	3.952	23	35	54.1	1.59	7	59.9					
21	17	42	42.95	3.130	23	35	48.3	1.30	7	43.9					
25	17	42	32.11	2.286	23	35	43.7	0.99	7	28.0					
29	17	42	24.68	1.428	23	35	40.4	0.64	7	12.2					
Sept. 2	17	42	20.71	-0.554	-23	35	38.5	+0.30	6	56.4					
6	17	42	20.27	+0.336	23	35	38.0	-0.05	6	40.6					
10	17	42	23.41	1.235	23	35	38.9	0.41	6	25.0					
14	17	42	30.15	2.136	23	35	41.3	0.79	6	9.4					
18	17	42	40.49	3.032	23	35	45.2	1.15	5	53.8					
22	17	42	54.39	+3.917	-23	35	50.5	-1.49	5	38.3					
26	17	43	11.81	4.791	23	35	57.1	1.81	5	22.9					
30	17	43	32.70	5.651	23	36	5.0	2.12	5	7.5					
Oct. 4	17	43	57.00	6.498	23	36	14.1	2.40	4	52.2					
8	17	44	24.66	7.329	23	36	24.2	2.64	4	36.9					
12	17	44	55.60	+8.135	-23	36	35.2	-2.85	4	21.7					
16	17	45	29.70	8.910	23	36	47.0	3.02	4	6.6					
20	17	46	6.84	9.653	23	36	59.4	3.16	3	51.5					
24	17	46	46.88	10.360	23	37	12.3	3.25	3	36.4					
28	17	47	29.68	11.031	23	37	25.4	3.29	3	21.4					
Nov. 1	17	48	15.12	+11.679	-23	37	38.6	-3.30	3	6.4					
5	17	49	3.06	12.285	23	37	51.8	3.26	2	51.5					
9	17	49	53.34	12.847	23	38	4.7	3.20	2	36.6					
13	17	50	45.77	13.360	23	38	17.2	3.06	2	21.7					
17	17	51	40.16	13.828	23	38	29.2	2.91	2	6.9					
21	17	52	36.33	+14.248	-23	38	40.5	-2.71	1	52.1					
25	17	53	34.08	14.621	23	38	50.9	2.47	1	37.3					
29	17	54	33.24	14.951	23	39	0.3	2.20	1	22.6					
Dec. 3	17	55	33.62	15.230	23	39	8.5	1.91	1	7.9					
7	17	56	35.01	15.457	23	39	15.6	1.61	0	53.1					
11	17	57	37.20	+15.628	-23	39	21.4	-1.29	0	38.4					
15	17	58	39.96	15.740	23	39	25.9	0.95	0	23.8					
19	17	59	43.08	15.806	23	39	29.0	0.60	0	9.1					
23	18	0	46.34	15.817	23	39	30.7	-0.24	23	50.7					
27	18	1	49.55	15.778	23	39	30.9	+0.12	23	36.0					
31	18	2	52.50	+15.689	-23	39	29.7	+0.46	23	21.3					
35	18	3	54.99	+15.544	-23	39	27.2	+0.79	23	6.6					

Greatest semidiameter,  
Least semidiameter,

June 19, 1.83"  
December 22, 1.65"

Greatest horizontal parallax,  
Least horizontal parallax,

June 19, 0.48"  
December 22, 0.43"

## GREENWICH MEAN TIME.

Month and Day.	Apparent Right Ascension.	Var. of R. A. for 1 Day.	Apparent Declination.	Var. of Decl. for 1 Day.	Meridian Passage.	Month and Day.	Apparent Right Ascension.	Var. of R. A. for 1 Day.	Apparent Declination.	Var. of Decl. for 1 Day.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
Jan. 2	6 18 55.32	-7.294	+22 17 31.8	+4.14	11 34.1	July 4	6 25 30.94	+9.608	+22 19 49.6	-5.55	23 33.5
6	6 18 26.31	7.201	22 17 48.4	4.17	11 17.9	8	6 26 9.25	9.541	22 19 26.9	5.76	23 18.4
10	6 17 57.77	7.062	22 18 5.2	4.20	11 1.7	12	6 26 47.22	9.438	22 19 3.4	5.97	23 3.3
14	6 17 29.88	6.874	22 18 22.0	4.21	10 45.5	16	6 27 24.71	9.302	22 18 39.1	6.15	22 48.2
18	6 17 2.84	6.640	22 18 38.9	4.22	10 29.3	20	6 28 1.59	9.131	22 18 14.2	6.29	22 33.1
22	6 16 36.82	-6.360	+22 18 55.7	+4.19	10 13.2	24	6 28 37.73	+8.934	+22 17 48.8	-6.40	22 18.0
26	6 16 12.01	6.041	22 19 12.3	4.13	9 57.0	28	6 29 13.02	8.706	22 17 23.0	6.49	22 2.8
30	6 15 48.54	5.685	22 19 28.7	4.06	9 40.9	Aug. 1	6 29 47.34	8.450	22 16 56.9	6.54	21 47.7
Feb. 3	6 15 26.58	5.292	22 19 44.8	4.00	9 24.8	5	6 30 20.58	8.164	22 16 30.7	6.54	21 32.5
7	6 15 6.25	4.867	22 20 0.7	3.92	9 8.8	9	6 30 52.61	7.846	22 16 4.6	6.51	21 17.3
11	6 14 47.69	-4.411	+22 20 16.2	+3.82	8 52.8	13	6 31 23.31	+7.501	+22 15 38.6	-6.45	21 2.1
15	6 14 31.00	3.923	22 20 31.3	3.71	8 36.8	17	6 31 52.58	7.127	22 15 13.0	6.35	20 46.8
19	6 14 16.32	3.412	22 20 45.9	3.60	8 20.8	21	6 32 20.29	6.728	22 14 47.8	6.21	20 31.5
23	6 14 3.73	2.879	22 21 0.1	3.47	8 4.9	25	6 32 46.36	6.307	22 14 23.3	6.03	20 16.2
27	6 13 53.31	2.330	22 21 13.7	3.34	7 49.0	29	6 33 10.71	5.861	22 13 59.6	5.82	20 0.9
Mar. 2	6 13 45.11	-1.768	+22 21 26.8	+3.20	7 33.1	Sept. 2	6 33 33.22	+5.392	+22 13 36.7	-5.57	19 45.5
6	6 13 39.18	1.195	22 21 39.3	3.05	7 17.3	6	6 33 53.82	4.903	22 13 15.0	5.27	19 30.1
10	6 13 35.56	0.612	22 21 51.2	2.87	7 1.5	10	6 34 12.42	4.393	22 12 54.5	4.95	19 14.7
14	6 13 34.29	-0.023	22 22 2.3	2.69	6 45.7	14	6 34 28.94	3.865	22 12 35.4	4.59	18 59.3
18	6 13 35.38	+0.569	22 22 12.7	2.51	6 30.0	18	6 34 43.32	3.323	22 12 17.8	4.20	18 43.8
22	6 13 38.84	+1.161	+22 22 22.4	+2.31	6 14.4	22	6 34 55.51	+2.771	+22 12 1.8	-3.80	18 28.2
26	6 13 44.66	1.745	22 22 31.2	2.10	5 58.8	26	6 35 5.47	2.207	22 11 47.4	3.37	18 12.7
30	6 13 52.80	2.321	22 22 39.2	1.89	5 43.2	30	6 35 13.15	1.632	22 11 34.9	2.90	17 57.1
Apr. 3	6 14 3.22	2.888	22 22 46.3	1.65	5 27.6	Oct. 4	6 35 18.52	1.052	22 11 24.2	2.42	17 41.4
7	6 14 15.89	3.444	22 22 52.4	1.40	5 12.1	8	6 35 21.56	+0.468	22 11 15.5	1.92	17 25.7
11	6 14 30.76	+3.990	+22 22 57.5	+1.13	4 56.6	12	6 35 22.26	-0.119	+22 11 8.8	-1.41	17 10.0
15	6 14 47.79	4.520	22 23 1.4	0.85	4 41.1	16	6 35 20.61	0.702	22 11 4.2	0.89	16 54.3
19	6 15 6.80	5.029	22 23 4.3	0.57	4 25.8	20	6 35 16.65	1.278	22 11 1.7	-0.37	16 38.5
23	6 15 27.99	5.518	22 23 6.0	+0.27	4 10.4	24	6 35 10.40	1.845	22 11 1.2	+0.14	16 22.6
27	6 15 51.00	5.983	22 23 6.5	-0.04	3 55.1	28	6 35 1.91	2.401	22 11 2.8	0.66	16 6.8
May 1	6 16 15.82	+6.424	+22 23 5.7	-0.35	3 39.8	Nov. 1	6 34 51.21	-2.943	+22 11 6.5	+1.17	15 50.9
5	6 16 42.36	6.844	22 23 3.7	0.67	3 24.5	5	6 34 38.39	3.468	22 11 12.2	1.67	15 34.9
9	6 17 10.54	7.239	22 23 0.3	1.02	3 9.2	9	6 34 23.49	3.976	22 11 19.9	2.16	15 18.9
13	6 17 40.24	7.608	22 22 55.5	1.37	2 54.0	13	6 34 6.62	4.455	22 11 29.5	2.62	15 2.9
17	6 18 11.37	7.949	22 22 40.3	1.71	2 38.8	17	6 33 47.89	4.904	22 11 40.9	3.06	14 46.9
21	6 18 43.79	+8.256	+22 22 41.8	-2.05	2 23.6	21	6 33 27.43	-5.321	+22 11 54.0	+3.47	14 30.8
25	6 19 17.38	8.535	22 22 32.9	2.40	2 8.4	25	6 33 5.36	5.708	22 12 8.7	3.86	14 14.7
29	6 19 52.03	8.784	22 22 22.6	2.76	1 53.2	29	6 32 41.81	6.061	22 12 24.9	4.21	13 58.6
June 2	6 20 27.61	9.002	22 22 10.8	3.12	1 38.1	Dec. 3	6 32 16.92	6.377	22 12 42.4	4.54	13 42.4
6	6 21 4.01	9.193	22 21 57.6	3.46	1 23.0	7	6 31 50.85	6.653	22 13 1.2	4.84	13 26.3
10	6 21 41.11	+9.352	+22 21 43.1	-3.80	1 7.9	11	6 31 23.76	-6.880	+22 13 21.1	+5.09	13 10.1
14	6 22 18.78	9.477	22 21 27.2	4.14	0 52.8	15	6 30 55.85	7.060	22 13 41.9	5.29	12 53.9
18	6 22 56.88	9.568	22 21 10.0	4.45	0 37.7	19	6 30 27.32	7.196	22 14 3.4	5.46	12 37.7
22	6 23 35.28	9.624	22 20 51.6	4.75	0 22.6	23	6 29 58.34	7.288	22 14 25.6	5.62	12 21.5
26	6 24 13.83	9.649	22 20 32.0	5.04	0 7.5	27	6 29 29.08	7.333	22 14 48.4	5.74	12 5.3
30	6 24 52.43	+9.644	+22 20 11.3	-5.30	23 48.6	31	6 28 59.74	-7.329	+22 15 11.5	+5.81	11 49.1
July 4	6 25 30.94	+9.608	+22 19 49.6	-5.55	23 33.5	35	6 28 30.51		+22 15 34.9		11 32.9

Least semidiameter,  
Greatest semidiameter,

June 28, 1".25  
December 28, 1".34

Least horizontal parallax,  
Greatest horizontal parallax,

June 28, 0".28  
December 28, 0".30

MERCURY.													
GREENWICH MEAN NOON.													
Date.	Heliocentric Longitude, Mean Equinox of Date.			Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—				
	°	'	"						At Date.	At Intermediate Date.			
Jan.	0	13	54 37.8	5 13 36.8	— 11 49.6	— 3 51 23.2	+ 32 3.5	9.529 3562	0.004 3876	9.998 8792			
	1	19	12 48.1	5 22 42.9	10 41.3	3 17 54.1	34 53.5	9.522 8798	9.993 2457	9.987 4896			
	2	24	40 0.5	5 31 39.7	9 8.0	2 41 39.7	37 33.0	9.516 7005	9.981 6146	9.975 6245			
	3	30	16 1.8	5 40 19.2	7 11.5	2 2 53.5	39 56.5	9.510 9026	9.969 5258	9.963 3246			
	4	36	0 30.0	5 48 31.8	4 54.9	1 21 53.9	41 58.5	9.505 5731	9.957 0293	9.950 6496			
	5	41	52 52.9	5 56 7.0	— 2 22.9	— 0 39 5.7	+ 43 33.0	9.500 7998	9.944 1964	9.937 6827			
	6	47	52 28.1	6 2 54.8	+ 0 18.4	+ 0 5 1.1	44 34.5	9.496 6681	9.931 1230	9.924 5337			
	7	53	58 23.0	6 8 44.2	3 1.7	0 49 50.7	44 58.0	9.493 2570	9.917 9332	9.911 3417			
	8	60	9 33.7	6 13 25.1	5 38.8	1 34 43.3	44 39.9	9.490 6356	9.904 7813	9.898 2760			
	9	66	24 47.5	6 16 48.9	8 1.5	2 18 56.1	43 38.1	9.488 8597	9.891 8517	9.885 5360			
	10	72	42 43.4	6 18 48.3	+ 10 1.9	+ 3 1 45.0	+ 41 52.4	9.487 9682	9.879 3579	9.873 3473			
	11	79	1 54.4	6 19 18.6	11 33.3	3 42 27.1	39 25.0	9.487 9813	9.867 5355	9.861 9545			
	12	85	20 50.2	6 18 17.9	12 31.0	4 20 22.5	36 19.9	9.488 8986	9.856 6351	9.851 6080			
	13	91	38 0.1	6 15 47.1	12 52.2	4 54 56.3	32 42.9	9.490 6994	9.846 9035	9.842 5513			
	14	97	51 55.7	6 11 50.2	12 36.6	5 25 40.1	28 41.3	9.493 3445	9.838 5776	9.835 0062			
	15	104	1 14.0	6 6 33.9	+ 11 46.3	+ 5 52 13.2	+ 24 22.9	9.496 7775	9.831 8576	9.829 1493			
	16	110	4 39.9	6 0 6.9	10 25.2	6 14 22.8	19 55.4	9.500 9289	9.826 8941	9.825 1013			
	17	116	1 7.8	5 52 39.8	8 38.8	6 32 3.6	15 26.6	9.505 7193	9.823 7752	9.822 9162			
	18	121	49 43.2	5 44 23.9	6 33.4	6 45 18.0	11 3.2	9.511 0636	9.822 5201	9.822 5787			
	19	127	29 43.2	5 35 30.9	4 15.6	6 54 13.8	6 50.6	9.516 8739	9.823 0800	9.824 0087			
	20	133	0 36.4	5 26 12.0	+ 1 52.0	+ 6 59 4.1	+ 2 52.4	9.523 0630	9.825 3457	9.827 0693			
	21	138	22 2.0	5 16 37.5	— 0 31.5	7 0 5.4	— 0 47.5	9.529 5467	9.829 1570	9.831 5850			
	22	143	33 49.5	5 6 57.2	2 49.7	6 57 36.5	4 7.3	9.536 2462	9.834 3273	9.837 3574			
	23	148	35 57.0	4 57 18.7	4 58.3	6 51 57.6	7 7.1	9.543 0890	9.840 6494	9.844 1779			
	24	153	28 29.9	4 47 49.1	6 54.3	6 43 29.1	9 46.5	9.550 0087	9.847 9171	9.851 8421			
	25	158	11 39.9	4 38 33.7	— 8 35.3	+ 6 32 31.2	12 6.2	9.556 9473	9.855 9298	9.860 1577			
	26	162	45 43.3	4 29 36.5	9 59.9	6 19 23.0	14 7.1	9.563 8537	9.864 5051	9.868 9524			
	27	167	11 0.0	4 21 0.8	11 7.4	6 4 22.7	15 50.8	9.570 6833	9.873 4813	9.878 0749			
	28	171	27 52.7	4 12 48.7	11 57.7	5 47 46.7	17 18.5	9.577 3982	9.882 7181	9.887 3967			
	29	175	36 45.7	4 5 1.5	12 31.3	5 29 50.4	18 32.0	9.583 9666	9.892 0980	9.896 8101			
	30	179	38 4.3	3 57 40.1	— 12 48.9	+ 5 10 47.2	— 19 32.5	9.590 3619	9.901 5232	9.906 2276			
31	183	32 14.5	3 50 44.6	12 51.6	4 50 49.3	20 21.6	9.596 5618	9.910 9155	9.915 5794				
Feb.	1	187	19 42.1	3 44 14.9	12 40.4	4 30 7.4	21 0.7	9.602 5485	9.920 2129	9.924 8102			
	2	191	0 52.7	3 38 10.5	12 16.8	4 8 50.8	21 31.1	9.608 3075	9.929 3666	9.933 8778			
	3	194	36 11.3	3 32 30.7	11 42.0	3 47 7.7	21 53.8	9.613 8271	9.938 3401	9.942 7503			
	4	198	6 2.1	3 27 14.9	— 10 57.5	+ 3 25 5.3	— 22 10.0	9.619 0987	9.947 1058	9.951 4044			
	5	201	30 48.7	3 22 22.0	10 4.6	3 2 49.6	22 20.4	9.624 1153	9.955 6444	9.959 8243			
	6	204	50 53.5	3 17 51.2	9 4.6	2 40 26.2	22 25.7	9.628 8718	9.963 9429	9.967 9993			
	7	208	6 38.2	3 13 41.6	7 58.6	2 17 59.5	22 26.9	9.633 3643	9.971 9929	9.975 9235			
	8	211	18 23.4	3 9 52.1	6 48.0	1 55 33.6	22 24.1	9.637 5906	9.979 7907	9.983 5944			
	9	214	26 28.8	3 6 21.8	— 5 33.7	+ 1 33 11.9	22 18.7	9.641 5489	9.987 3346	9.991 0118			
	10	217	31 13.2	3 3 10.1	4 16.8	1 10 57.2	22 10.3	9.645 2388	9.994 6264	9.998 1785			
	11	220	32 54.8	3 0 15.9	2 58.2	0 48 52.2	21 59.3	9.648 6600	0.001 6689	0.005 0981			
	12	223	31 50.6	2 57 38.5	1 38.9	0 26 59.2	21 46.4	9.651 8126	0.008 4668	0.011 7755			
	13	226	28 17.1	2 55 17.2	— 0 19.6	+ 0 5 19.9	21 31.8	9.654 6971	0.015 0250	0.018 2162			
	14	229	22 30.2	2 53 11.4	+ 0 58.9	— 0 16 3.9	— 21 15.5	9.657 3145	0.021 3500	0.024 4270			
	15	232	14 44.9	2 51 20.4	+ 2 15.9	0 37 10.6	— 20 57.8	9.659 6656	0.027 4482	0.030 4143			

## MERCURY.

## GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
Feb. 15	232 14 44.9	2 51 20.4	+ 2 15.9	— 0 37 10.6	— 20 57.8	9.659 6656	0.027 4482	0.030 4143
16	235 5 15.9	2 49 43.9	3 30.8	0 57 59.0	20 38.7	9.661 7514	0.033 3263	0.036 1849
17	237 54 17.4	2 48 21.3	4 43.0	1 18 27.7	20 18.5	9.663 5730	0.038 9910	0.041 7454
18	240 42 2.9	2 47 12.0	5 51.9	1 38 35.7	19 57.2	9.665 1310	0.044 4489	0.047 1025
19	243 28 45.8	2 46 16.0	6 57.0	1 58 21.8	19 34.8	9.666 4267	0.049 7069	0.052 2629
20	246 14 39.1	2 45 32.8	+ 7 57.9	— 2 17 45.0	— 19 11.4	9.667 4608	0.054 7713	0.057 2330
21	248 59 55.6	2 45 2.2	8 54.1	2 36 44.3	18 47.0	9.668 2339	0.059 6487	0.062 0191
22	251 44 47.6	2 44 43.9	9 45.2	2 55 18.6	18 21.5	9.668 7465	0.064 3448	0.066 6266
23	254 29 27.6	2 44 38.1	10 30.8	3 13 26.9	17 54.9	9.668 9989	0.068 8652	0.071 0613
24	257 14 7.8	2 44 44.4	11 10.6	3 31 8.0	17 27.1	9.668 9913	0.073 2155	0.075 3282
25	259 59 0.4	2 45 2.9	+ 11 44.6	— 3 48 20.7	— 16 58.1	9.668 7237	0.077 4001	0.079 4319
26	262 44 17.7	2 45 33.7	12 11.5	4 5 3.8	16 27.8	9.668 1962	0.081 4240	0.083 3770
27	265 30 11.9	2 46 16.7	12 32.0	4 21 15.8	15 56.0	9.667 4079	0.085 2912	0.087 1671
28	268 16 55.3	2 47 12.2	12 45.5	4 36 55.4	15 22.8	9.666 3587	0.089 0052	0.090 8059
29	271 4 40.5	2 48 20.3	12 51.8	4 52 0.4	14 47.9	9.665 0477	0.092 5695	0.094 2964
Mar. 1	273 53 40.2	2 49 41.3	+ 12 50.7	— 5 6 30.4	— 14 10.8	9.663 4743	0.095 9866	0.097 6409
2	276 44 7.4	2 51 15.3	12 42.1	5 20 21.9	13 31.9	9.661 6376	0.099 2588	0.100 8413
3	279 36 15.3	2 53 2.8	12 25.9	5 33 33.5	12 50.8	9.659 5364	0.102 3882	0.103 8995
4	282 30 17.7	2 55 4.2	12 1.8	5 46 2.6	12 6.9	9.657 1698	0.105 3754	0.106 8161
5	285 26 28.4	2 57 19.7	11 30.0	5 57 46.4	11 20.4	9.654 5370	0.108 2216	0.109 5918
6	288 25 2.0	2 59 50.1	+ 10 50.4	— 6 8 42.4	— 10 30.8	9.651 6369	0.110 9267	0.112 2263
7	291 26 13.6	3 2 35.7	10 3.1	6 18 46.9	9 37.7	9.648 4689	0.113 4904	0.114 7188
8	294 30 18.6	3 5 37.1	9 8.2	6 27 56.6	8 41.0	9.645 0321	0.115 9114	0.117 0679
9	297 37 33.2	3 8 54.9	8 6.0	6 36 7.6	7 40.2	9.641 3264	0.118 1881	0.119 2716
10	300 48 14.1	3 12 29.8	6 56.8	6 43 15.5	6 34.9	9.637 3521	0.120 3180	0.121 3273
11	304 2 38.8	3 16 22.6	+ 5 41.0	— 6 49 15.7	— 5 24.6	9.633 1103	0.122 2986	0.123 2313
12	307 21 5.4	3 20 33.9	4 19.2	6 54 3.0	4 9.1	9.628 6022	0.124 1250	0.124 9791
13	310 43 52.7	3 25 4.2	2 52.1	6 57 31.9	2 47.7	9.623 8304	0.125 7932	0.126 5663
14	314 11 20.4	3 29 54.5	+ 1 20.6	6 59 36.3	— 1 19.9	9.618 7989	0.127 2975	0.127 9861
15	317 43 48.5	3 35 5.3	— 0 14.4	7 0 9.5	+ 0 14.6	9.613 5127	0.128 6311	0.129 2319
16	321 21 38.1	3 40 37.4	— 1 51.5	— 6 59 4.6	+ 1 56.1	9.607 9787	0.129 7870	0.130 2953
17	325 5 10.6	3 46 31.3	3 29.3	6 56 14.3	3 45.7	9.602 2059	0.130 7556	0.131 1668
18	328 54 48.1	3 52 47.4	5 6.1	6 51 30.3	5 43.5	9.596 2062	0.131 5274	0.131 8362
19	332 50 52.9	3 59 26.0	6 40.0	6 44 44.5	7 49.5	9.589 9943	0.132 0916	0.132 2919
20	336 53 47.6	4 6 27.1	8 8.8	6 35 48.4	10 4.2	9.583 5881	0.132 4354	0.132 5205
21	341 3 54.6	4 13 50.5	— 9 30.1	— 6 24 33.2	+ 12 27.7	9.577 0101	0.132 5452	0.132 5074
22	345 21 35.9	4 21 35.6	10 41.4	6 10 50.3	14 59.5	9.570 2874	0.132 4053	0.132 2370
23	349 47 12.7	4 29 41.2	11 39.8	5 54 31.6	17 39.2	9.563 4521	0.132 0000	0.131 6920
24	354 21 4.7	4 38 5.8	12 22.7	5 35 29.4	20 26.1	9.556 5425	0.131 3104	0.130 8530
25	359 3 29.8	4 46 46.9	12 47.3	5 13 37.4	23 18.8	9.549 6034	0.130 3170	0.129 6999
26	3 54 43.0	4 55 41.4	12 51.1	4 48 50.5	+ 26 15.2	9.542 6861	0.128 9990	0.128 2115
27	8 54 55.6	5 4 45.1	12 31.8	4 21 6.4	29 12.9	9.535 8497	0.127 3346	0.126 3654
28	14 4 14.6	5 13 53.0	11 47.9	3 50 25.3	32 8.7	9.529 1604	0.125 3008	0.124 1380
29	19 22 41.0	5 22 58.9	10 38.8	3 16 51.0	34 58.5	9.522 6913	0.122 8739	0.121 5055
30	24 50 9.4	5 31 55.6	9 4.8	2 40 31.9	37 37.5	9.516 5218	0.120 0302	0.118 4448
31	30 26 26.2	5 40 34.3	7 7.7	2 1 41.4	+ 40 0.5	9.510 7362	0.116 7465	0.114 9325
Apr. 1	36 11 9.0	5 48 45.9	4 50.6	— 1 20 38.2	+ 42 1.7	9.505 4215	0.113 0002	0.110 9469

MERCURY.									
GREENWICH MEAN NOON.									
Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—		
							At Date.	At Interme- diate Date.	
Apr. 1	36 11 9.0	5 48 45.9	- 4 50.6	- 1 20 38.2	+ 42 1.7	9.505 4215	0.113 0002	0.110 9469	
2	42 3 45.6	5 56 20.1	- 2 18.2	- 0 37 47.1	43 35.4	9.500 6659	0.108 7705	0.106 4685	
3	48 3 33.2	6 3 6.2	+ 0 23.3	+ 0 6 21.5	44 35.8	9.496 5541	0.104 0391	0.101 4804	
4	54 9 38.5	6 8 53.7	3 6.5	0 51 11.9	44 58.0	9.493 1650	0.098 7910	0.095 9695	
5	60 20 57.7	6 13 32.7	5 43.4	1 36 3.9	44 38.7	9.490 5679	0.093 0152	0.089 9270	
6	66 36 17.7	6 16 53.9	+ 8 5.5	+ 2 20 14.8	+ 43 35.5	9.488 8176	0.086 7050	0.083 3490	
7	72 54 17.3	6 18 50.2	10 5.1	3 3 0.5	41 48.5	9.487 9527	0.079 8596	0.076 2373	
8	79 13 29.5	6 19 18.5	11 35.6	3 43 38.2	39 20.0	9.487 9926	0.072 4834	0.068 5989	
9	85 32 23.8	6 18 14.9	12 32.2	4 21 28.0	36 13.8	9.488 9364	0.064 5860	0.060 4467	
10	91 49 29.4	6 15 41.6	12 52.2	4 55 55.3	32 36.0	9.490 7629	0.056 1835	0.051 7988	
11	98 3 18.3	6 11 42.3	+ 12 35.6	+ 5 26 31.9	+ 28 33.8	9.493 4322	0.047 2960	0.042 6782	
12	104 12 27.5	6 6 23.6	11 44.3	5 52 57.3	24 14.9	9.496 8875	0.037 9491	0.033 1121	
13	110 15 42.1	5 59 54.7	10 22.4	6 14 58.8	19 47.4	9.501 0589	0.028 1716	0.023 1314	
14	116 11 56.9	5 52 26.0	8 35.3	6 32 31.6	15 18.7	9.505 8672	0.017 9960	0.012 7696	
15	122 0 17.9	5 44 8.8	6 29.3	6 45 37.9	10 55.5	9.511 2266	0.007 4569	0.002 0626	
16	127 40 2.3	5 35 14.8	+ 4 11.3	+ 6 54 26.2	+ 6 43.2	9.517 0496	9.996 5914	9.991 0479	
17	133 10 39.1	5 25 55.4	+ 1 47.6	6 59 9.2	+ 2 45.9	9.523 2488	9.985 4371	9.979 7639	
18	138 31 48.0	5 16 20.6	- 0 35.8	7 0 3.9	- 0 53.3	9.529 7404	9.974 0333	9.968 2502	
19	143 43 18.4	5 6 40.1	2 53.7	6 57 29.0	4 13.0	9.536 4455	9.962 4198	9.956 5470	
20	148 45 8.9	4 57 1.9	5 2.1	6 51 44.6	7 12.3	9.543 2915	9.950 6370	9.944 6950	
21	153 37 25.1	4 47 32.5	- 6 57.6	+ 6 43 11.2	- 9 51.1	9.550 2130	9.938 7262	9.932 7359	
22	158 20 18.7	4 38 17.5	8 38.1	6 32 9.0	12 10.1	9.557 1515	9.926 7292	9.920 7116	
23	162 54 6.2	4 29 21.0	10 2.2	6 18 57.1	14 10.6	9.564 0562	9.914 6886	9.908 6658	
24	167 19 7.8	4 20 45.9	11 9.2	6 3 53.6	15 53.6	9.570 8831	9.902 6488	9.896 6433	
25	171 35 45.9	4 12 34.5	11 59.0	5 47 15.0	17 20.9	9.577 5943	9.890 6551	9.884 6900	
26	175 44 25.1	4 4 48.1	- 12 32.1	+ 5 29 16.4	- 18 34.0	9.584 1582	9.878 7544	9.872 8542	
27	179 45 30.7	3 57 27.4	12 49.2	5 10 11.3	19 34.1	9.590 5479	9.866 9960	9.861 1861	
28	183 39 28.6	3 50 32.7	12 51.4	4 50 11.9	20 23.0	9.596 7419	9.855 4313	9.849 7380	
29	187 26 44.6	3 44 3.7	12 39.9	4 29 28.8	21 1.8	9.602 7222	9.844 1132	9.838 5639	
30	191 7 44.4	3 38 0.1	12 15.9	4 8 11.2	21 32.0	9.608 4743	9.833 0973	9.827 7208	
May 1	194 42 52.9	3 32 21.0	- 11 40.8	+ 3 46 27.4	- 21 54.5	9.613 9869	9.822 4416	9.817 2670	
2	198 12 34.3	3 27 5.8	10 56.0	3 24 24.4	22 10.5	9.619 2511	9.812 2048	9.807 2624	
3	201 37 12.2	3 22 13.6	10 2.9	3 2 8.4	22 20.6	9.624 2602	9.802 4476	9.797 7680	
4	204 57 8.9	3 17 43.5	9 2.6	2 39 44.8	22 25.9	9.629 0089	9.793 2310	9.788 8444	
5	208 12 46.2	3 13 34.4	7 56.5	2 17 18.0	22 26.9	9.633 4937	9.784 6155	9.780 5520	
6	211 24 24.5	3 9 45.5	- 6 45.7	+ 1 54 52.2	- 22 24.2	9.637 7123	9.776 6607	9.772 9490	
7	214 32 23.6	3 6 15.9	5 31.3	1 32 30.6	22 18.5	9.641 6628	9.769 4234	9.766 0903	
8	217 37 2.4	3 3 4.6	4 14.4	1 10 16.2	22 9.9	9.645 3449	9.762 9561	9.760 0265	
9	220 38 38.7	3 0 10.9	2 55.8	0 48 11.5	21 59.0	9.648 7580	9.757 3070	9.754 8024	
10	223 37 29.8	2 57 34.0	1 36.4	0 26 18.8	21 46.0	9.651 9026	9.752 5171	9.750 4548	
11	226 33 52.1	2 55 13.2	- 0 17.1	+ 0 4 40.0	- 21 31.3	9.654 7792	9.748 6188	9.747 0122	
12	229 28 1.3	2 53 7.8	+ 1 1.3	- 0 16 43.3	21 15.0	9.657 3887	9.745 6368	9.744 4941	
13	232 20 12.7	2 51 17.4	2 18.3	0 37 49.5	20 57.2	9.659 7319	9.743 5848	9.742 9094	
14	235 10 40.8	2 49 41.2	3 33.1	0 58 37.2	20 38.1	9.661 8099	9.742 4673	9.742 2576	
15	237 59 39.7	2 48 19.0	4 45.2	1 19 5.4	20 17.9	9.663 6235	9.742 2784	9.742 5273	
16	240 47 23.2	2 47 10.2	+ 5 54.0	- 1 39 12.7	- 19 56.5	9.665 1739	9.743 0015	9.743 6974	
17	243 34 4.4	2 46 14.5	+ 6 59.0	- 1 58 58.1	- 19 34.1	9.666 4619	9.744 6112	9.745 7384	

## MERCURY.

## GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Interme- diate Date.
May 17	243 34 4.4	2 46 14.5	+ 6 59.0	- 1 58 58.1	- 19 34.1	9.666 4619	9.744 6112	9.745 7384
18	246 19 56.4	2 45 31.6	7 59.7	2 18 20.6	19 10.7	9.667 4882	9.747 0741	9.748 6132
19	249 5 11.8	2 45 1.3	8 55.7	2 37 19.1	18 46.2	9.668 2535	9.750 3498	9.752 2782
20	251 50 3.2	2 44 43.5	9 46.7	2 55 52.7	18 20.7	9.668 7582	9.754 3920	9.756 6847
21	254 34 43.0	2 44 38.1	10 32.1	3 14 0.1	17 54.0	9.669 0029	9.759 1496	9.761 7802
22	257 19 23.4	2 44 44.8	+ 11 11.7	- 3 31 40.3	- 17 26.2	9.668 9876	9.764 5695	9.767 5107
23	260 4 16.6	2 45 3.6	11 45.2	3 48 52.1	16 57.2	9.668 7122	9.770 5968	9.773 8208
24	262 49 34.7	2 45 34.7	12 12.2	4 5 34.2	16 26.9	9.668 1767	9.777 1760	9.780 6555
25	265 35 30.1	2 46 18.2	12 32.5	4 21 45.4	15 55.1	9.667 3806	9.784 2528	9.787 9610
26	268 22 15.2	2 47 14.0	12 45.8	4 37 23.9	15 21.7	9.666 3236	9.791 7738	9.795 6846
27	271 10 2.4	2 48 22.5	+ 12 51.9	- 4 52 28.3	- 14 46.7	9.665 0047	9.799 6877	9.803 7771
28	273 59 4.5	2 49 43.9	12 50.6	5 6 56.6	14 9.7	9.663 4232	9.807 9471	9.812 1917
29	276 49 34.5	2 51 18.3	12 41.8	5 20 47.0	13 30.7	9.661 5784	9.816 5060	9.820 8845
30	279 41 45.6	2 53 6.2	12 25.2	5 33 57.3	12 49.4	9.659 4692	9.825 3226	9.829 8152
31	282 35 51.6	2 55 8.0	12 0.9	5 46 25.0	12 5.5	9.657 0945	9.834 3579	9.838 9461
June 1	285 32 6.4	2 57 24.0	+ 11 28.9	- 5 58 7.4	- 11 18.9	9.654 4535	9.843 5760	9.848 2432
2	288 30 44.5	2 59 54.7	10 49.1	6 9 1.7	10 29.2	9.651 5452	9.852 9442	9.857 6754
3	291 32 1.0	3 2 40.9	10 1.5	6 19 4.7	9 36.1	9.648 3690	9.862 4336	9.867 2146
4	294 36 11.5	3 5 42.8	9 6.4	6 28 12.6	8 39.2	9.644 9239	9.872 0163	9.876 8350
5	297 43 32.0	3 9 1.1	8 4.0	6 36 21.6	7 38.3	9.641 2101	9.881 6681	9.886 5127
6	300 54 19.4	3 12 36.6	+ 6 54.6	- 6 43 27.7	- 6 32.8	9.637 2277	9.891 3664	9.896 2266
7	304 8 51.2	3 16 29.9	5 38.6	6 49 25.7	5 22.4	9.632 9776	9.901 0910	9.905 9573
8	307 27 25.4	3 20 41.6	4 16.7	6 54 10.7	4 6.7	9.628 4614	9.910 8233	9.915 6870
9	310 50 20.9	3 25 12.6	2 49.4	6 57 37.1	2 45.0	9.623 6817	9.920 5461	9.925 3983
10	314 17 57.3	3 30 3.5	+ 1 17.7	- 6 59 38.7	- 1 17.1	9.618 6422	9.930 2420	9.935 0754
11	317 50 34.8	3 35 15.0	- 0 17.3	- 7 0 9.1	+ 0 17.6	9.613 3481	9.939 8967	9.944 7038
12	321 28 34.4	3 40 47.8	1 54.5	6 59 1.1	1 59.6	9.607 8064	9.949 4950	9.954 2686
13	325 12 17.7	3 46 42.4	3 32.3	6 56 7.3	3 49.3	9.602 0263	9.959 0227	9.963 7557
14	329 2 6.6	3 52 59.2	5 9.0	6 51 19.8	5 47.2	9.596 0197	9.968 4656	9.973 1506
15	332 58 23.6	3 59 38.5	6 42.8	6 44 30.1	7 53.6	9.589 8014	9.977 8090	9.982 4390
16	337 1 31.1	4 6 40.3	- 8 11.4	- 6 35 29.8	+ 10 8.5	9.583 3895	9.987 0386	9.991 6061
17	341 11 51.6	4 14 4.4	9 32.4	6 24 10.2	12 32.1	9.576 8066	9.996 1393	0.000 6363
18	345 29 47.1	4 21 50.1	10 43.4	6 10 22.7	15 4.2	9.570 0796	0.005 0950	0.009 5134
19	349 55 38.7	4 29 56.4	11 41.4	5 53 59.1	17 44.3	9.563 2413	0.013 8892	0.018 2204
20	354 29 46.2	4 38 21.5	12 23.8	5 34 51.8	20 31.3	9.556 3299	0.022 5044	0.026 7387
21	359 12 27.2	4 47 3.0	- 12 47.8	- 5 12 54.5	+ 23 24.1	9.549 3904	0.030 9209	0.035 0487
22	4 3 56.7	4 55 57.9	12 50.8	4 48 2.3	26 20.7	9.542 4745	0.039 1193	0.043 1298
23	9 4 26.0	5 5 1.9	12 30.8	4 20 12.7	29 18.5	9.535 6414	0.047 0775	0.050 9597
24	14 14 1.8	5 14 9.8	11 46.2	3 49 26.1	32 14.0	9.528 9574	0.054 7734	0.058 5154
25	19 32 45.0	5 23 15.7	10 36.3	3 15 46.7	35 3.5	9.522 4959	0.062 1828	0.065 7726
26	25 0 30.0	5 32 11.9	- 9 1.6	- 2 39 22.7	+ 37 42.4	9.516 3364	0.069 2815	0.072 7063
27	30 37 2.8	5 40 50.0	7 3.8	2 0 27.8	40 4.5	9.510 5636	0.076 0439	0.079 2911
28	36 22 0.8	5 49 0.7	4 46.1	1 19 20.9	42 5.1	9.505 2645	0.082 4451	0.085 5024
29	42 14 51.5	5 56 33.5	- 2 13.3	- 0 36 26.9	43 37.8	9.500 5271	0.088 4603	0.091 3156
30	48 14 51.7	6 3 18.0	+ 0 28.4	+ 0 7 43.6	44 37.1	9.496 4360	0.094 0658	0.096 7082
July 1	54 21 7.9	6 9 3.7	+ 3 11.5	+ 0 52 34.7	+ 44 58.2	9.493 0701	0.099 2403	0.101 6594
2	60 32 36.0	6 13 40.4	+ 5 48.0	+ 1 37 26.1	+ 44 37.4	9.490 4978	0.103 9638	0.106 1513

MERCURY.												
GREENWICH MEAN NOON.												
Date.	Heliocentric Longitude, Mean Equinox of Date.			Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.			Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
	°	'	"			°	'	"			At Date.	At Intermediate Date.
July	1	54	21 7.9	6 9 3.7	+ 3 11.5	+ 0 52 34.7	+ 44 58.2	9.493 0701	0.099 2403	0.101 6594		
	2	60	32 36.0	6 13 40.4	5 48.0	1 37 26.1	44 37.4	9.490 4978	0.103 9638	0.106 1513		
	3	66	48 2.5	6 16 59.1	8 9.5	2 21 35.1	43 32.9	9.488 7741	0.108 2207	0.110 1705		
	4	73	6 6.0	6 18 53.3	10 8.3	3 4 17.5	41 44.7	9.487 9365	0.111 9996	0.113 7072		
	5	79	25 19.3	6 19 18.2	11 37.8	3 44 50.7	39 14.8	9.488 0041	0.115 2928	0.116 7560		
	6	85	44 12.0	6 18 12.0	+ 12 33.3	+ 4 22 34.8	+ 36 7.5	9.488 9753	0.118 0969	0.119 3160		
	7	92	1 13.4	6 15 35.9	12 52.3	4 56 55.4	32 28.9	9.490 8284	0.120 4142	0.121 3922		
	8	98	14 55.2	6 11 33.9	12 34.5	5 27 24.6	28 26.0	9.493 5229	0.122 2511	0.122 9927		
	9	104	23 54.9	6 6 13.0	11 42.2	5 53 42.0	24 6.7	9.497 0013	0.123 6190	0.124 1311		
	10	110	26 57.9	5 59 42.0	10 19.4	6 15 35.2	19 39.1	9.501 1938	0.124 5317	0.124 8229		
	11	116	22 59.4	5 52 11.8	+ 8 31.6	+ 6 32 59.8	+ 15 10.5	9.506 0204	0.125 0073	0.125 0869		
	12	122	11 5.4	5 43 53.2	6 25.2	6 45 58.0	10 47.5	9.511 3957	0.125 0649	0.124 9440		
	13	127	50 33.7	5 34 58.2	4 6.9	6 54 38.5	6 35.7	9.517 2316	0.124 7270	0.124 4165		
	14	133	20 53.5	5 25 38.0	+ 1 43.1	6 59 14.3	+ 2 38.8	9.523 4412	0.124 0155	0.123 5267		
	15	138	41 44.8	5 16 3.0	— 0 40.2	7 0 2.1	— 0 59.9	9.529 9406	0.122 9532	0.122 2980		
	16	143	52 57.6	5 6 22.5	— 2 57.9	+ 6 57 21.0	— 4 18.8	9.536 6514	0.121 5636	0.120 7527		
	17	148	54 30.5	4 56 44.3	5 5.9	6 51 31.2	7 17.4	9.543 5011	0.119 8679	0.118 9122		
	18	153	46 29.3	4 47 15.3	7 1.0	6 42 52.9	9 55.7	9.550 4243	0.117 8877	0.116 7968		
	19	158	29 6.0	4 38 0.8	8 41.0	6 31 46.3	12 14.2	9.557 3628	0.115 6421	0.114 4259		
	20	163	2 37.1	4 29 4.8	10 4.5	6 18 30.7	14 14.1	9.564 2659	0.113 1503	0.111 8178		
	21	167	27 22.8	4 20 30.4	— 11 11.0	+ 6 3 23.9	— 15 56.7	9.571 0900	0.110 4300	0.108 9890		
	22	171	43 45.9	4 12 19.8	12 0.3	5 46 42.6	17 23.4	9.577 7974	0.107 4963	0.105 9537		
	23	175	52 10.8	4 4 34.2	12 32.9	5 28 41.8	18 36.0	9.584 3565	0.104 3629	0.102 7256		
	24	179	53 2.8	3 57 14.2	12 49.5	5 9 34.9	19 35.7	9.590 7409	0.101 0431	0.099 3170		
	25	183	46 47.8	3 50 20.3	12 51.2	4 49 34.0	20 24.3	9.596 9288	0.097 5484	0.095 7384		
	26	187	33 52.0	3 43 52.3	— 12 39.3	+ 4 28 49.6	— 21 2.9	9.602 9025	0.093 8881	0.091 9988		
	27	191	14 40.7	3 37 49.3	12 15.1	4 7 31.1	21 32.8	9.608 6477	0.090 0713	0.088 1068		
	28	194	49 38.7	3 32 10.6	11 39.7	3 45 46.6	21 55.2	9.614 1529	0.086 1058	0.084 0691		
	29	198	19 10.3	3 26 56.4	10 54.5	3 23 43.0	22 10.9	9.619 4096	0.081 9975	0.079 8917		
	30	201	43 39.1	3 22 5.0	10 1.1	3 1 26.8	22 20.8	9.624 4107	0.077 7522	0.075 5795		
	31	205	3 27.5	3 17 35.5	— 9 0.7	+ 2 39 3.0	— 22 25.9	9.629 1514	0.073 3741	0.071 1364		
Aug.	1	208	18 57.0	3 13 27.0	7 54.4	2 16 36.3	22 26.8	9.633 6281	0.068 8669	0.066 5660		
	2	211	30 28.2	3 9 38.7	6 43.5	1 54 10.5	22 24.1	9.637 8384	0.064 2338	0.061 8705		
	3	214	38 20.9	3 6 9.7	5 29.0	1 31 49.1	22 18.3	9.641 7808	0.059 4764	0.057 0517		
	4	217	42 53.7	3 2 58.9	4 11.9	1 9 34.9	22 9.6	9.645 4546	0.054 5964	0.052 1107		
	5	220	44 24.6	3 0 5.8	— 2 53.3	+ 0 47 30.6	— 21 58.7	9.648 8596	0.049 5947	0.047 0483		
	6	223	43 10.8	2 57 29.3	1 33.9	0 25 38.2	21 45.7	9.651 9961	0.044 4716	0.041 8645		
	7	226	39 28.6	2 55 9.0	— 0 14.7	+ 0 3 59.9	21 30.7	9.654 8645	0.039 2269	0.036 5587		
	8	229	33 33.9	2 53 4.2	+ 1 3.8	— 0 17 22.8	21 14.4	9.657 4658	0.033 8599	0.031 1302		
	9	232	25 41.9	2 51 14.2	2 20.7	0 38 28.5	20 56.6	9.659 8009	0.028 3696	0.025 5780		
	10	235	16 7.0	2 49 38.4	+ 3 35.4	— 0 59 15.6	— 20 37.5	9.661 8706	0.022 7551	0.019 9007		
	11	238	5 3.3	2 48 16.5	4 47.4	1 19 43.1	20 17.3	9.663 6762	0.017 0146	0.014 0966		
	12	240	52 44.5	2 47 8.2	5 56.1	1 39 49.8	19 55.9	9.665 2183	0.011 1465	0.008 1642		
	13	243	39 24.0	2 46 12.9	7 0.9	1 59 34.5	19 33.4	9.666 4983	0.005 1493	0.002 1017		
	14	246	25 14.6	2 45 30.4	8 1.5	2 18 56.3	19 10.0	9.667 5165	9.999 0211	9.995 9073		
	15	249	10 29.0	2 45 0.5	+ 8 57.4	— 2 37 54.1	— 18 45.4	9.668 2737	9.992 7601	9.989 5796		
	16	251	55 19.8	2 44 43.1	+ 9 48.2	— 2 56 26.8	— 18 19.8	9.668 7704	9.986 3654	9.983 1174		



## MERCURY.

## GREENWICH MEAN NOON.

Date.	Heliocentric Longitude. Mean Equinox of Date.			Daily Motion.	Reduction to Orbit.			Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
	°	'	"		°	'	"				At Date.	At Interme- diate Date.
Aug. 16	251	55	19.8	2 41 43.1	+	9	48.2	- 2 56 26.8	- 18 19.8	9.668 7704	9.986 3654	9.983 1174
17	254	39	59.4	2 44 38.1		10	33.4	3 14 33.4	17 53.1	9.669 0070	9.979 8356	9.976 5197
18	257	24	40.0	2 44 45.1		11	12.8	3 32 12.7	17 25.3	9.668 9836	9.973 1699	9.969 7864
19	260	9	33.7	2 45 4.3		11	46.1	3 49 23.6	16 56.3	9.668 7001	9.966 3691	9.962 9176
20	262	54	52.7	2 45 35.8		12	12.9	4 6 4.8	16 25.9	9.668 1565	9.959 4325	9.955 9142
21	265	40	49.5	2 46 19.7	+	12	33.0	- 4 22 14.9	- 15 54.1	9.667 3523	9.952 3630	9.948 7789
22	268	27	36.3	2 47 15.9		12	46.1	4 37 52.4	15 20.7	9.666 2870	9.945 1627	9.941 5149
23	271	15	25.6	2 48 24.8		12	52.0	4 52 55.7	14 45.6	9.664 9599	9.937 8364	9.934 1277
24	274	4	30.2	2 49 46.6		12	50.4	5 7 22.9	14 8.5	9.663 3703	9.930 3900	9.926 6244
25	276	55	3.1	2 51 21.4		12	41.4	5 21 12.1	13 29.5	9.661 5172	9.922 8321	9.919 0146
26	279	47	17.5	2 53 9.7	+	12	24.6	- 5 34 21.1	- 12 48.1	9.659 3998	9.915 1736	9.911 3106
27	282	41	27.2	2 55 12.0		12	0.1	5 46 47.4	12 4.2	9.657 0167	9.907 4280	9.903 5284
28	285	37	46.3	2 57 28.5		11	27.8	5 58 28.5	11 17.4	9.654 3674	9.899 6143	9.895 6885
29	288	36	29.1	2 59 59.7		10	47.7	6 9 21.2	10 27.6	9.651 4508	9.891 7544	9.887 8157
30	291	37	50.8	3 2 46.3		9	59.9	6 19 22.5	9 34.4	9.648 2660	9.883 8764	9.879 9408
31	294	42	6.9	3 5 48.6	+	9	4.6	- 6 28 28.7	- 8 37.5	9.644 8126	9.876 0136	9.872 1002
Sept. 1	297	49	33.6	3 9 7.5		8	2.0	6 36 36.1	7 36.3	9.641 0904	9.868 2065	9.864 3389
2	301	0	27.7	3 12 43.6		6	52.3	6 43 39.8	6 30.5	9.637 0995	9.860 5041	9.856 7095
3	304	15	6.7	3 16 37.4		5	36.2	6 49 35.6	5 20.1	9.632 8411	9.852 9630	9.849 2735
4	307	33	48.7	3 20 49.8		4	14.0	6 54 18.3	4 4.2	9.628 3165	9.845 6501	9.842 1028
5	310	56	52.7	3 25 21.4	+	2	46.6	- 6 57 42.1	- 2 42.5	9.623 5286	9.838 6422	9.835 2796
6	314	24	38.2	3 30 13.0	+	1	14.9	6 59 41.1	- 1 14.3	9.618 4809	9.832 0267	9.828 8961
7	317	57	25.5	3 35 26.1	-	0	20.3	7 0 8.5	+ 0 20.6	9.613 1789	9.825 9011	9.823 0551
8	321	35	35.6	3 40 59.6		1	57.5	6 58 57.4	2 2.9	9.607 6296	9.820 3726	9.817 8683
9	325	19	29.9	3 46 54.8		3	35.3	6 56 0.2	3 52.9	9.601 8422	9.815 5571	9.813 4543
10	329	9	30.6	3 53 12.4	-	5	12.0	- 6 51 8.9	+ 5 51.0	9.595 8287	9.811 5750	9.809 9349
11	333	6	0.1	3 59 52.4		6	45.6	6 44 15.4	7 57.5	9.589 6038	9.808 5487	9.807 4321
12	337	9	20.8	4 6 54.4		8	14.0	6 35 10.9	10 12.9	9.583 1862	9.806 5991	9.806 0634
13	341	19	55.2	4 14 19.6		9	34.8	6 23 46.8	12 36.7	9.576 5984	9.805 8375	9.805 9333
14	345	38	5.3	4 22 6.1		10	45.4	6 9 54.6	15 9.1	9.569 8674	9.806 3609	9.807 1295
15	350	4	12.2	4 30 12.0	-	11	43.0	- 5 53 26.0	+ 17 49.4	9.563 0260	9.808 2458	9.809 7149
16	354	38	35.5	4 38 37.7		12	24.8	5 34 13.5	20 36.7	9.556 1129	9.811 5400	9.813 7228
17	359	21	32.9	4 47 19.6		12	48.2	5 12 10.8	23 29.6	9.549 1732	9.816 2621	9.819 1547
18	4	13	19.2	4 56 14.8		12	50.6	4 47 13.1	26 26.3	9.542 2589	9.822 3952	9.825 9757
19	9	14	5.5	5 5 19.0		12	29.8	4 19 17.9	29 24.0	9.535 4292	9.829 8872	9.834 1184
20	14	23	58.5	5 14 27.1	-	11	44.4	- 3 48 25.9	+ 32 19.4	9.528 7510	9.838 6558	9.843 4836
21	19	42	58.9	5 23 32.7		10	33.8	3 14 41.1	35 8.6	9.522 2978	9.848 5856	9.853 9442
22	25	11	0.6	5 32 28.5		8	58.3	2 38 12.3	37 46.7	9.516 1491	9.859 5406	9.865 3546
23	30	47	49.7	5 41 5.9		6	59.8	1 59 12.9	40 8.7	9.510 3898	9.871 3660	9.877 5539
24	36	33	3.1	5 49 15.5		4	41.5	1 18 2.2	42 8.5	9.505 1070	9.883 8974	9.890 3751
25	42	26	8.0	5 56 47.0	-	2	8.4	0 35 5.3	+ 43 40.2	9.500 3885	9.896 9662	9.903 6498
26	48	26	20.9	6 3 29.8	+	0	33.5	+ 0 9 7.0	44 38.4	9.496 3191	9.910 4059	9.917 2144
27	54	32	47.9	6 9 13.1		3	16.5	0 53 58.7	44 58.2	9.492 9771	9.924 0564	9.930 9136
28	60	44	24.6	6 13 47.7		5	52.7	1 38 49.5	44 36.1	9.490 4306	9.937 7688	9.944 6053
29	66	59	57.3	6 17 4.0		8	13.6	2 22 56.4	43 30.2	9.488 7340	9.951 4079	9.958 1620
30	73	18	4.4	6 18 55.5	+	10	11.5	+ 3 5 35.5	+ 41 40.6	9.487 9247	9.964 8541	9.971 4717
Oct. 1	79	37	18.4	6 19 17.5	+	11	40.1	+ 3 46 3.9	+ 39 9.5	9.488 0209	9.978 0039	9.984 4405

MERCURY.													
GREENWICH MEAN NOON.													
Date.	Heliocentric Longitude, Mean Equinox of Date.			Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.			Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—		
	°	'	"			°	'	"			At Date.	At Inter- mediate Date.	
Oct.	1	79	37 18.4	6 19 17.5	+ 11 40.1	+ 3 46 3.9	+ 39 9.5	9.488 0209	9.978 0039	9.984 4405			
	2	85	56 9.0	6 18 8.5	12 34.8	4 23 42.2	36 1.2	9.489 0202	9.990 7723	9.996 9914			
	3	92	13 5.4	6 15 29.6	12 52.3	4 57 56.0	32 21.7	9.490 9005	0.003 0907	0.009 0639			
	4	98	26 39.6	6 11 25.1	12 33.4	5 28 17.6	28 18.1	9.493 6204	0.014 0059	0.020 6126			
	5	104	35 29.2	6 6 1.8	11 40.1	5 54 26.9	23 58.5	9.497 1225	0.026 1805	0.031 6069			
	6	110	38 19.9	5 59 28.8	+ 10 16.4	+ 6 16 11.8	+ 19 30.7	9.501 3361	0.036 8899	0.042 0284			
	7	116	34 7.2	5 51 56.8	8 27.9	6 33 28.0	15 2.2	9.506 1813	0.047 0218	0.051 8699			
	8	122	21 57.6	5 43 37.0	6 21.1	6 46 18.1	10 39.5	9.511 5723	0.056 5730	0.061 1322			
	9	128	1 9.1	5 34 41.0	4 2.5	6 54 50.7	6 28.0	9.517 4213	0.065 5486	0.069 8242			
	10	133	31 11.3	5 25 20.2	+ 1 38.6	6 59 19.1	+ 2 31.8	9.523 6413	0.073 9606	0.077 9599			
	11	138	51 44.6	5 15 44.8	— 0 44.5	+ 7 0 0.2	— 1 6.4	9.530 1486	0.081 8246	0.085 5573			
	12	144	2 39.2	5 6 4.2	3 2.0	6 57 12.9	4 24.7	9.536 8646	0.089 1608	0.092 6378			
	13	149	3 53.9	4 56 26.3	5 9.6	6 51 17.5	7 22.7	9.543 7173	0.095 9914	0.099 2244			
	14	153	55 34.9	4 46 57.7	7 4.3	6 42 34.3	10 0.3	9.550 6418	0.102 3398	0.105 3406			
	15	158	37 54.2	4 37 43.7	8 43.8	6 31 23.5	12 18.2	9.557 5798	0.108 2298	0.111 0104			
	16	163	11 8.6	4 28 48.4	— 10 6.9	+ 6 18 4.1	— 14 17.6	9.564 4812	0.113 6853	0.116 2576			
	17	167	35 38.2	4 20 14.8	11 12.8	6 2 54.2	15 59.6	9.571 3021	0.118 7301	0.121 1055			
	18	171	51 46.0	4 12 4.9	12 1.6	5 46 10.2	17 25.9	9.578 0054	0.123 3866	0.125 5760			
	19	175	59 56.3	4 4 20.0	12 33.6	5 28 7.1	18 38.0	9.584 5594	0.127 6762	0.129 6899			
	20	180	0 34.6	3 57 0.9	12 49.8	5 8 58.4	19 37.4	9.590 9379	0.131 6194	0.133 4672			
	21	183	54 6.8	3 50 7.8	— 12 51.1	+ 4 48 56.0	— 20 25.7	9.597 1192	0.135 2354	0.136 9262			
	22	187	40 58.8	3 43 40.4	12 38.7	4 28 10.4	21 3.9	9.603 0858	0.138 5418	0.140 0841			
	23	191	21 36.0	3 37 38.3	12 14.0	4 6 51.0	21 33.5	9.608 8236	0.141 5551	0.142 9567			
	24	194	56 23.5	3 32 0.7	11 38.3	3 45 5.8	21 55.7	9.614 3213	0.144 2905	0.145 5585			
	25	198	25 45.4	3 26 47.0	10 53.0	3 23 1.8	22 11.2	9.619 5699	0.146 7620	0.147 9026			
	26	201	50 5.1	3 21 56.1	— 9 59.3	+ 3 0 45.3	— 22 21.1	9.624 5630	0.148 9818	0.150 0011			
	27	205	9 45.0	3 17 27.3	8 58.7	2 38 21.3	22 26.1	9.629 2955	0.150 9618	0.151 8651			
	28	208	25 6.8	3 13 19.7	7 52.2	2 15 54.5	22 26.9	9.633 7639	0.152 7122	0.153 5044			
	29	211	36 31.0	3 9 32.0	6 41.2	1 53 28.8	22 24.0	9.637 9658	0.154 2427	0.154 9281			
	30	214	44 17.1	3 6 3.4	5 26.6	1 31 7.6	22 18.0	9.641 8998	0.155 5615	0.156 1439			
	31	217	48 43.9	3 2 53.2	— 4 9.5	+ 1 8 53.7	— 22 9.4	9.645 5653	0.156 6760	0.157 1588			
Nov.	1	220	50 9.4	3 0 0.7	2 50.9	0 46 49.7	21 58.2	9.648 9618	0.157 5929	0.157 9791			
	2	223	48 50.8	2 57 24.8	1 31.5	0 24 57.9	21 45.1	9.652 0898	0.158 3179	0.158 6101			
	3	226	45 4.3	2 55 4.9	— 0 12.2	+ 0 3 20.0	21 30.3	9.654 9498	0.158 8561	0.159 0566			
	4	229	39 5.7	2 53 0.4	+ 1 6.1	— 0 18 2.2	21 13.9	9.657 5428	0.159 2121	0.159 3227			
	5	232	31 10.2	2 51 10.9	+ 2 23.0	— 0 39 7.4	— 20 56.1	9.659 8695	0.159 3889	0.159 4113			
	6	235	21 32.3	2 49 35.6	3 37.7	0 59 54.0	20 36.9	9.661 9310	0.159 3901	0.159 3257			
	7	238	10 26.1	2 48 14.1	4 49.6	1 20 20.8	20 16.6	9.663 7283	0.159 2181	0.159 0676			
	8	240	58 5.2	2 47 6.2	5 58.1	1 40 26.8	19 55.2	9.665 2623	0.158 8744	0.158 6388			
	9	243	44 42.9	2 46 11.4	7 2.9	2 0 10.8	19 32.7	9.666 5340	0.158 3608	0.158 0403			
	10	246	30 32.2	2 45 29.4	+ 8 3.3	— 2 19 31.9	— 19 9.2	9.667 5441	0.157 6775	0.157 2725			
	11	249	15 45.8	2 44 59.9	8 59.0	2 38 28.9	18 44.6	9.668 2931	0.156 8251	0.156 3355			
	12	252	0 36.1	2 44 42.8	9 49.6	2 57 0.8	18 19.0	9.668 7819	0.155 8033	0.155 2286			
	13	254	45 15.5	2 44 38.0	10 34.8	3 15 6.6	17 52.3	9.669 0103	0.154 6111	0.153 9508			
	14	257	29 56.2	2 44 45.5	11 14.0	3 32 45.1	17 24.5	9.668 9787	0.153 2474	0.152 5006			
	15	260	14 50.5	2 45 5.2	+ 11 47.1	— 3 49 55.1	— 16 55.3	9.668 6872	0.151 7102	0.150 8759			
	16	263	0 10.6	2 45 37.1	+ 12 13.7	— 4 6 35.3	— 16 24.9	9.668 1355	0.149 9974	0.149 0742			

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.			Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.			Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
	°	'	"			°	'	"			At Date.	At Intermediate Date.
Nov. 16	263	0	10.6	2 45 37.1	+ 12 13.7	- 4	6	35.3	- 16 24.9	9.668 1355	0.149 9974	0.149 0742
17	265	46	8.8	2 46 21.3	12 33.5	4	22	44.5	15 53.1	9.667 3233	0.148 1058	0.147 0920
18	268	32	57.3	2 47 17.8	12 46.4	4	38	21.0	15 19.6	9.666 2499	0.146 0321	0.144 9255
19	271	20	48.7	2 48 27.2	12 52.0	4	53	23.1	14 44.4	9.664 9147	0.143 7718	0.142 5705
20	274	9	55.9	2 49 49.3	12 50.3	5	7	49.2	14 7.4	9.663 3170	0.141 3208	0.140 0221
21	277	0	31.7	2 51 24.5	+ 12 41.0	- 5	21	37.2	- 13 28.2	9.661 4557	0.138 6736	0.137 2747
22	279	52	49.5	2 53 13.3	12 24.0	5	34	44.9	12 46.7	9.659 3300	0.135 8245	0.134 3222
23	282	47	3.0	2 55 16.0	11 59.2	5	47	9.8	12 2.7	9.656 9388	0.132 7669	0.131 1577
24	285	43	26.3	2 57 32.9	11 26.7	5	58	49.4	11 15.9	9.654 2812	0.129 4935	0.127 7734
25	288	42	13.8	3 0 4.6	10 46.4	6	9	40.6	10 26.0	9.651 3562	0.125 9964	0.124 1614
26	291	43	40.7	3 2 51.7	+ 9 58.4	- 6	19	40.3	- 9 32.7	9.648 1631	0.122 2672	0.120 3126
27	294	48	2.5	3 5 54.6	9 2.8	6	28	44.7	8 35.5	9.644 7013	0.118 2962	0.116 2168
28	297	55	35.4	3 9 14.0	7 59.9	6	36	50.0	7 34.2	9.640 9708	0.114 0729	0.111 8633
29	301	6	36.2	3 12 50.5	6 50.1	6	43	51.7	6 28.6	9.636 9717	0.109 5865	0.107 2409
30	304	21	22.5	3 16 45.0	5 33.7	6	49	45.5	5 18.0	9.632 7050	0.104 8250	0.102 3371
Dec. 1	307	40	12.4	3 20 57.9	+ 4 11.4	- 6	54	25.8	- 4 1.8	9.628 1723	0.099 7755	0.097 1385
2	311	3	24.8	3 25 30.1	2 43.8	6	57	47.1	2 39.8	9.623 3760	0.094 4243	0.091 6311
3	314	31	19.3	3 30 22.3	+ 1 12.0	6	59	43.3	- 1 11.5	9.618 3204	0.088 7568	0.085 7997
4	318	4	16.3	3 35 35.2	- 0 23.3	7	0	7.8	+ 0 23.7	9.613 0107	0.082 7576	0.079 6287
5	321	42	36.7	3 41 9.3	2 0.3	6	58	53.5	2 6.2	9.607 4538	0.076 4108	0.073 1019
6	325	26	42.1	3 47 5.2	- 3 38.3	- 6	55	52.9	+ 3 56.4	9.601 6593	0.069 6998	0.066 2024
7	329	16	54.5	3 53 23.3	5 14.9	6	50	58.0	5 54.8	9.595 6390	0.062 6076	0.058 9132
8	333	13	36.3	4 0 4.1	6 48.4	6	44	0.5	8 1.6	9.589 4082	0.055 1172	0.051 2173
9	337	17	10.2	4 7 7.4	8 16.7	6	34	51.9	10 17.1	9.582 9850	0.047 2116	0.043 0980
10	341	27	58.4	4 14 32.7	9 37.2	6	23	23.4	12 41.4	9.576 3923	0.038 8748	0.034 5400
11	345	46	22.9	4 22 19.7	- 10 47.4	- 6	9	26.4	+ 15 14.0	9.569 6575	0.030 0922	0.025 5298
12	350	12	44.8	4 30 27.3	11 44.5	5	52	52.8	17 54.5	9.562 8134	0.020 8516	0.016 0566
13	354	47	23.8	4 38 53.5	12 25.8	5	33	35.1	20 42.0	9.555 8988	0.011 1443	0.006 1145
14	359	30	37.3	4 47 36.0	12 48.6	5	11	27.0	23 35.0	9.548 9593	0.000 9671	9.995 7028
15	4	22	40.1	4 56 31.5	12 50.3	+ 4	46	23.9	26 31.7	9.542 0467	9.990 3229	9.984 8293
16	9	23	43.3	5 5 35.9	- 12 28.8	- 4	18	23.2	+ 29 29.5	9.535 2209	9.979 2247	9.973 5125
17	14	33	53.2	5 14 41.0	11 42.6	3	47	25.8	32 24.8	9.528 5486	9.967 6973	9.961 7845
18	19	53	10.4	5 23 19.4	10 31.2	3	13	35.8	35 13.8	9.522 1036	9.955 7808	9.949 6945
19	25	21	28.6	5 32 44.7	8 54.9	2	37	2.0	37 51.8	9.515 9657	9.943 5349	9.937 3133
20	30	58	33.6	5 41 21.4	6 55.7	1	57	58.3	40 12.8	9.510 2200	9.931 0425	9.924 7372
21	36	44	2.1	5 49 30.1	- 4 37.0	- 1	16	43.9	+ 42 11.7	9.504 9535	9.918 4139	9.912 0913
22	42	37	20.8	5 57 0.1	- 2 3.4	- 0	33	44.2	43 42.5	9.500 2539	9.905 7899	9.899 5326
23	48	37	46.0	6 3 41.3	+ 0 38.5	+ 0	10	29.9	44 39.5	9.496 2059	9.893 3444	9.887 2524
24	54	44	23.5	6 9 22.8	3 21.5	0	55	22.1	44 58.1	9.492 8877	9.881 2854	9.875 4738
25	60	56	8.5	6 13 54.8	5 57.3	1	40	12.2	44 34.8	9.490 3669	9.869 8493	9.864 4453
26	67	11	47.1	6 17 8.6	+ 8 17.6	+ 2	24	17.1	+ 43 27.5	9.488 6974	9.859 2955	9.854 4335
27	73	29	57.4	6 18 57.4	10 14.8	3	6	52.7	41 36.5	9.487 9159	9.849 8928	9.845 7057
28	79	49	12.0	6 19 16.6	11 42.3	3	47	16.5	39 4.2	9.488 0401	9.841 9027	9.838 5122
29	86	8	0.2	6 18 4.7	12 35.6	4	24	48.9	35 54.8	9.489 0670	9.835 5589	9.833 0642
30	92	24	51.4	6 15 23.1	12 52.2	4	58	55.9	32 14.4	9.490 9739	9.831 0450	9.829 5141
31	98	38	17.9	6 11 16.1	+ 12 32.2	+ 5	29	9.9	+ 28 10.3	9.493 7188	9.828 4784	9.827 9404
32	104	46	57.4	6 5 50.5	+ 11 37.9	+ 5	55	11.2	+ 23 50.3	9.497 2440	9.827 8973	

## VENUS.

## GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.			Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.			Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth.	
	°	'	"			°	'	"			At Date.	At Intermediate Date.
Jan. 0	162	20	5.9	1 37 25.3	+ 0 21.9	+ 3 23	14.5		+ 0 20.9	9.856 8124	9.966 7539	9.970 1222
2	165	34	54.2	1 37 22.9	+ 0 1.5	3 23	36.8		+ 0 1.3	9.856 9043	9.973 4569	9.976 7581
4	168	49	37.3	1 37 20.2	- 0 19.0	3 23	20.0		- 0 18.2	9.857 0038	9.980 0265	9.983 2621
6	172	4	14.7	1 37 17.1	0 39.2	3 22	24.3		0 37.6	9.857 1106	9.986 4655	9.989 6364
8	175	18	45.5	1 37 13.7	0 58.9	3 20	49.8		0 56.9	9.857 2245	9.992 7754	9.995 8827
10	178	33	9.3	1 37 10.1	- 1 17.8	+ 3 18	36.9		- 1 15.9	9.857 3450	9.998 9586	0.002 0035
12	181	47	25.6	1 37 6.1	1 35.7	3 15	46.1		1 34.7	9.857 4717	0.005 0176	0.008 0013
14	185	1	33.6	1 37 1.9	1 52.4	3 12	18.0		1 53.2	9.857 6042	0.010 9549	0.013 8788
16	188	15	33.0	1 36 57.4	2 7.7	3 8	13.3		2 11.3	9.857 7421	0.016 7735	0.019 6393
18	191	29	23.1	1 36 52.7	2 21.3	3 3	33.0		2 28.9	9.857 8849	0.022 4767	0.025 2861
20	194	43	3.8	1 36 47.8	- 2 33.1	+ 2 58	18.0		- 2 46.0	9.858 0323	0.028 0679	0.030 8224
22	197	56	34.5	1 36 42.8	2 43.0	2 52	29.3		3 2.6	9.858 1836	0.033 5501	0.036 2514
24	201	9	55.0	1 36 37.6	2 50.8	2 46	8.2		3 18.5	9.858 3385	0.038 9267	0.041 5764
26	204	23	4.9	1 36 32.3	2 56.4	2 39	16.0		3 33.7	9.858 4964	0.044 2009	0.046 8005
28	207	36	4.2	1 36 26.9	2 59.9	2 31	54.0		3 48.2	9.858 6568	0.049 3757	0.051 9268
30	210	48	52.6	1 36 21.4	- 3 1.0	+ 2 24	3.6		- 4 2.0	9.858 8192	0.054 4541	0.056 9579
Feb. 1	214	1	30.0	1 36 15.9	2 59.9	2 15	46.5		4 14.9	9.858 9831	0.059 4383	0.061 8957
3	217	13	56.4	1 36 10.4	2 56.5	2 7	4.3		4 27.1	9.859 1480	0.064 3300	0.066 7416
5	220	26	11.8	1 36 4.9	2 50.9	1 57	58.6		4 38.3	9.859 3133	0.069 1304	0.071 4966
7	223	38	16.3	1 35 59.5	2 43.2	1 48	31.3		4 48.7	9.859 4787	0.073 8403	0.076 1617
9	226	50	10.0	1 35 54.2	- 2 33.5	+ 1 38	44.1		- 4 58.2	9.859 6434	0.078 4609	0.080 7383
11	230	1	53.1	1 35 48.9	2 21.9	1 28	38.9		5 6.7	9.859 8070	0.082 9940	0.085 2280
13	233	13	25.7	1 35 43.8	2 8.5	1 18	17.7		5 14.2	9.859 9691	0.087 4407	0.089 6322
15	236	24	48.3	1 35 38.8	1 53.5	1 7	42.4		5 20.7	9.860 1290	0.091 8029	0.093 9529
17	239	36	1.1	1 35 34.0	1 37.1	0 56	54.9		5 26.3	9.860 2863	0.096 0825	0.098 1919
19	242	47	4.5	1 35 29.4	- 1 19.6	+ 0 45	57.4		- 5 30.8	9.860 4406	0.100 2814	0.102 3512
21	245	57	58.8	1 35 25.0	1 1.1	0 34	51.9		5 34.3	9.860 5913	0.104 4016	0.106 4329
23	249	8	44.6	1 35 20.8	0 41.8	0 23	40.4		5 36.8	9.860 7380	0.108 4453	0.110 4393
25	252	19	22.2	1 35 16.8	0 22.1	0 12	24.9		5 38.3	9.860 8803	0.112 4149	0.114 3724
27	255	29	52.2	1 35 13.1	- 0 2.0	+ 0 1	7.6		5 38.7	9.861 0176	0.116 3121	0.118 2342
29	258	40	15.0	1 35 9.7	+ 0 18.0	0 10	9.5		- 5 38.0	9.861 1496	0.120 1387	0.122 0259
Mar. 2	261	50	31.3	1 35 6.5	0 37.8	0 21	24.3		5 36.4	9.861 2760	0.123 8958	0.125 7486
4	265	0	41.5	1 35 3.7	0 57.2	0 32	34.8		5 33.7	9.861 3962	0.127 5843	0.129 4030
6	268	10	46.3	1 35 1.1	1 15.8	0 43	39.0		5 30.1	9.861 5101	0.131 2047	0.132 9894
8	271	20	46.2	1 34 58.8	1 33.5	0 54	34.9		5 25.4	9.861 6171	0.134 7571	0.136 5078
10	274	30	41.9	1 34 56.8	+ 1 50.0	- 1 5	20.4		5 19.8	9.861 7170	0.138 2416	0.139 9588
12	277	40	33.8	1 34 55.1	2 5.2	1 15	53.7		5 13.2	9.861 8095	0.141 6593	0.143 3431
14	280	50	22.6	1 34 53.7	2 18.8	1 26	12.8		5 5.7	9.861 8944	0.145 0104	0.146 6614
16	284	0	8.9	1 34 52.5	2 30.8	1 36	16.0		4 57.2	9.861 9713	0.148 2961	0.149 9145
18	287	9	53.1	1 34 51.7	2 40.9	1 46	1.4		4 47.9	9.862 0401	0.151 5169	0.153 1032
20	290	19	36.0	1 34 51.1	+ 2 49.1	- 1 55	27.3		- 4 37.7	9.862 1005	0.154 6737	0.156 2286
22	293	29	17.9	1 34 50.8	2 55.2	2 4	31.9		4 26.7	9.862 1524	0.157 7681	0.159 2924
24	296	38	59.6	1 34 50.8	2 59.1	2 13	13.7		4 14.9	9.862 1955	0.160 8015	0.162 2955
26	299	48	41.3	1 34 51.0	3 0.9	2 21	31.2		4 2.3	9.862 2299	0.163 7746	0.165 2391
28	302	58	23.7	1 34 51.4	3 0.5	2 29	22.7		3 49.0	9.862 2554	0.166 6891	0.168 1245
30	306	8	7.2	1 34 52.1	+ 2 57.9	- 2 36	46.9		- 3 35.0	9.862 2718	0.169 5455	0.170 9522
Apr. 1	309	17	52.2	1 34 53.0	+ 2 53.1	- 2 43	42.5		- 3 20.4	9.862 2792	0.172 3446	0.173 7226

## VENUS.

## GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.			Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.			Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
	°	'	"			°	'	"			At Date.	At Intermediate Date.
Apr.	1	309	17 52.2	1 34 53.0	+ 2 53.1	- 2 43 42.5	- 3 20.4	9.862 2792	0.172 3446	0.173 7226		
	3	312	27 39.2	1 34 54.1	2 46.2	2 50 8.2	3 5.2	9.862 2776	0.175 0863	0.176 4356		
	5	315	37 28.6	1 34 55.3	2 37.3	2 56 2.9	2 49.4	9.862 2670	0.177 7704	0.179 0906		
	7	318	47 20.6	1 34 56.8	2 26.5	3 1 25.5	2 33.0	9.862 2473	0.180 3962	0.181 6875		
	9	321	57 15.8	1 34 58.4	2 13.9	3 6 14.9	2 16.3	9.862 2186	0.182 9641	0.184 226		
	11	325	7 14.3	1 35 0.1	+ 1 59.6	- 3 10 30.3	- 1 59.1	9.862 1811	0.185 4738	0.186 7066		
	13	328	17 16.4	1 35 2.0	1 43.9	3 14 11.0	1 41.5	9.862 1348	0.187 9249	0.189 1286		
	15	331	27 22.5	1 35 4.0	1 26.9	3 17 16.1	1 23.6	9.862 0799	0.190 3178	0.191 4926		
	17	334	37 32.7	1 35 6.2	1 8.9	3 19 45.2	1 5.4	9.862 0165	0.192 6529	0.193 7988		
	19	337	47 47.3	1 35 8.5	0 50.0	3 21 37.8	0 47.0	9.861 9449	0.194 9303	0.196 0475		
	21	340	58 6.6	1 35 10.8	+ 0 30.5	- 3 22 53.4	0 28.5	9.861 8652	0.197 1505	0.198 2395		
	23	344	8 30.6	1 35 13.2	+ 0 10.6	3 23 31.8	0 9.8	9.861 7777	0.199 3145	0.200 3757		
	25	347	18 59.6	1 35 15.7	- 0 9.5	3 23 32.8	+ 0 8.8	9.861 6827	0.201 4230	0.202 4565		
	27	350	29 33.6	1 35 18.3	0 29.4	3 22 56.4	0 27.5	9.861 5804	0.203 4763	0.204 4826		
	29	353	40 12.8	1 35 20.9	0 48.9	3 21 42.6	0 46.2	9.861 4711	0.205 4753	0.206 4544		
May	1	356	50 57.4	1 35 23.6	- 1 7.9	- 3 19 51.7	+ 1 4.7	9.861 3551	0.207 4197	0.208 3710		
	3	0	1 47.5	1 35 26.4	1 26.1	3 17 23.8	1 23.1	9.861 2329	0.209 3085	0.210 2321		
	5	3	12 43.1	1 35 29.2	1 43.2	3 14 19.4	1 41.2	9.861 1048	0.211 1418	0.212 0375		
	7	6	23 44.3	1 35 32.0	1 59.0	3 10 39.0	1 59.1	9.860 9711	0.212 9192	0.213 7867		
	9	9	34 51.2	1 35 34.9	2 13.4	3 6 23.2	2 16.6	9.860 8323	0.214 6400	0.215 4788		
	11	12	46 3.9	1 35 37.8	- 2 26.2	- 3 1 32.7	+ 2 33.7	9.860 6888	0.216 3033	0.217 1134		
	13	15	57 22.6	1 35 40.8	2 37.1	2 56 8.4	2 50.4	9.860 5410	0.217 9091	0.218 6903		
	15	19	8 47.2	1 35 43.8	2 46.1	2 50 11.1	3 6.6	9.860 3894	0.219 4569	0.220 2090		
	17	22	20 17.9	1 35 46.8	2 53.1	2 43 42.0	3 22.3	9.860 2345	0.220 9466	0.221 6697		
	19	25	31 54.7	1 35 49.9	2 57.9	2 36 42.2	3 37.4	9.860 0766	0.222 3784	0.223 0726		
	21	28	43 37.7	1 35 53.0	- 3 0.5	- 2 29 12.8	+ 3 51.8	9.859 9163	0.223 7525	0.224 4183		
	23	31	55 27.0	1 35 56.2	3 0.9	2 21 15.3	4 5.5	9.859 7541	0.225 0699	0.225 7073		
	25	35	7 22.7	1 35 59.4	2 59.0	2 12 51.1	4 18.5	9.859 5905	0.226 3305	0.226 9398		
	27	38	19 24.9	1 36 2.7	2 54.9	2 4 1.6	4 30.7	9.859 4260	0.227 5350	0.228 1161		
	29	41	31 33.6	1 36 6.0	2 48.6	1 54 48.5	4 42.1	9.859 2611	0.228 6832	0.229 2362		
June	31	44	43 49.0	1 36 9.4	- 2 40.1	- 1 45 13.5	+ 4 52.7	9.859 0963	0.229 7750	0.230 2998		
	2	47	56 11.1	1 36 12.8	2 29.7	1 35 18.3	5 2.4	9.858 9322	0.230 8103	0.231 3063		
	4	51	8 40.0	1 36 16.2	2 17.4	1 25 4.8	5 11.1	9.858 7692	0.231 7880	0.232 2554		
	6	54	21 15.9	1 36 19.7	2 3.4	1 14 34.7	5 18.8	9.858 6079	0.232 7082	0.233 1463		
	8	57	33 58.7	1 36 23.1	1 47.8	1 3 50.2	5 25.5	9.858 4488	0.233 5697	0.233 9785		
	10	60	46 48.5	1 36 26.7	- 1 30.8	- 0 52 53.2	+ 5 31.3	9.858 2923	0.234 3724	0.234 7513		
	12	63	59 45.5	1 36 30.3	1 12.7	0 41 45.6	5 36.0	9.858 1390	0.235 1153	0.235 4644		
	14	67	12 49.7	1 36 33.9	0 53.6	0 30 29.8	5 39.6	9.857 9893	0.235 7985	0.236 1175		
	16	70	26 1.0	1 36 37.5	0 33.9	0 19 7.7	5 42.2	9.857 8438	0.236 4215	0.236 7106		
	18	73	39 19.5	1 36 41.1	- 0 13.7	- 0 7 41.5	5 43.7	9.857 7029	0.236 9847	0.237 2439		
	20	76	52 45.3	1 36 44.7	+ 0 6.7	+ 0 3 46.6	+ 5 44.1	9.857 5671	0.237 4884	0.237 7182		
	22	80	6 18.3	1 36 48.3	0 27.0	0 15 14.4	5 43.4	9.857 4368	0.237 9333	0.238 1339		
	24	83	19 58.4	1 36 51.8	0 47.0	0 26 39.6	5 41.6	9.857 3124	0.238 3199	0.238 4913		
	26	86	33 45.6	1 36 55.3	1 6.4	0 38 0.1	5 38.7	9.857 1943	0.238 6482	0.238 7910		
	28	89	47 39.8	1 36 58.8	1 24.9	0 49 13.9	5 34.8	9.857 0828	0.238 9193	0.239 0331		
July	30	93	1 40.9	1 37 2.2	+ 1 42.4	+ 1 0 18.6	+ 5 29.7	9.856 9787	0.239 1323	0.239 2172		
	2	96	15 48.6	1 37 5.5	+ 1 58.6	+ 1 11 12.0	+ 5 23.5	9.856 8821	0.239 2875	0.239 3430		

VENUS.													
GREENWICH MEAN NOON.													
Date.		Heliocentric Longitude, Mean Equinox of Date.			Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.			Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
												At Date.	At Intermediate Date.
July	2	96	15	48.6	1 37 5.5	+ 1 58.6	+ 1 11	12.0	+ 5 23.5	9.856 8821	0.239 2875	0.239 3430	
	4	99	30	2.9	1 37 8.7	2 13.2	1 21	52.0	5 16.3	9.856 7927	0.239 3837	0.239 4097	
	6	102	44	23.5	1 37 11.8	2 26.2	1 32	16.6	5 8.1	9.856 7116	0.239 4210	0.239 4176	
	8	105	58	50.0	1 37 14.7	2 37.3	1 42	23.8	4 58.9	9.856 6388	0.239 3994	0.239 3665	
	10	109	13	22.3	1 37 17.5	2 46.4	1 52	11.5	4 48.7	9.856 5745	0.239 3186	0.239 2555	
	12	112	27	59.8	1 37 20.1	+ 2 53.4	+ 2 1	37.8	+ 4 37.5	9.856 5190	0.239 1773	0.239 0840	
	14	115	42	42.4	1 37 22.5	2 58.2	2 10	40.9	4 25.4	9.856 4725	0.238 9756	0.238 8522	
	16	118	57	29.5	1 37 24.6	3 0.6	2 19	19.0	4 12.5	9.856 4350	0.238 7138	0.238 5604	
	18	122	12	20.7	1 37 26.5	3 0.8	2 27	30.3	3 58.6	9.856 4067	0.238 3921	0.238 2090	
	20	125	27	15.6	1 37 28.2	2 58.6	2 35	13.2	3 44.1	9.856 3877	0.238 0112	0.237 7989	
	22	128	42	13.4	1 37 29.5	+ 2 54.2	+ 2 42	26.3	+ 3 28.8	9.856 3781	0.237 5721	0.237 3308	
	24	131	57	13.7	1 37 30.7	2 47.5	2 49	8.1	3 12.8	9.856 3780	0.237 0752	0.236 8052	
	26	135	12	16.0	1 37 31.5	2 38.6	2 55	17.3	2 56.2	9.856 3872	0.236 5210	0.236 2227	
	28	138	27	19.6	1 37 32.0	2 27.7	3 0	52.7	2 39.0	9.856 4058	0.235 9102	0.235 5834	
	30	141	42	23.8	1 37 32.0	2 14.9	3 5	53.2	2 21.3	9.856 4337	0.235 2424	0.234 8872	
Aug.	1	144	57	28.0	1 37 31.9	+ 2 0.4	+ 3 10	17.8	+ 2 3.2	9.856 4708	0.234 5179	0.234 1345	
	3	148	12	31.5	1 37 31.4	1 44.3	3 14	5.7	1 44.6	9.856 5170	0.233 7369	0.233 3251	
	5	151	27	33.6	1 37 30.5	1 26.9	3 17	16.2	1 25.7	9.856 5722	0.232 8990	0.232 4586	
	7	154	42	33.6	1 37 29.3	1 8.4	3 19	48.6	1 6.6	9.856 6361	0.232 0038	0.231 5347	
	9	157	57	30.9	1 37 27.8	0 49.0	3 21	42.5	0 47.3	9.856 7087	0.231 0512	0.230 5531	
	11	161	12	24.6	1 37 25.8	+ 0 29.0	+ 3 22	57.6	+ 0 27.8	9.856 7895	0.230 0406	0.229 5135	
	13	164	27	14.1	1 37 23.6	+ 0 8.6	3 23	33.6	+ 0 8.2	9.856 8784	0.228 9720	0.228 4161	
	15	167	41	58.8	1 37 21.0	- 0 11.9	3 23	30.5	- 0 11.3	9.856 9750	0.227 8459	0.227 2613	
	17	170	56	37.9	1 37 18.0	0 32.2	3 22	48.3	0 30.8	9.857 0791	0.226 6625	0.226 0496	
	19	174	11	10.8	1 37 14.8	0 52.1	3 21	27.3	0 50.1	9.857 1903	0.225 4227	0.224 7820	
	21	177	25	36.8	1 37 11.2	- 1 11.3	+ 3 19	27.8	- 1 9.3	9.857 3082	0.224 1275	0.223 4592	
	23	180	39	55.5	1 37 7.4	1 29.6	3 16	50.2	1 28.2	9.857 4325	0.222 7773	0.222 0819	
	25	183	54	6.1	1 37 3.3	1 46.7	3 13	35.0	1 46.8	9.857 5628	0.221 3731	0.220 6509	
	27	187	8	8.3	1 36 58.9	2 2.5	3 9	43.1	2 5.0	9.857 6986	0.219 9153	0.219 1661	
	29	190	22	1.6	1 36 54.3	2 16.7	3 5	15.1	2 22.8	9.857 8394	0.218 4035	0.217 6277	
Sept.	31	193	35	45.4	1 36 49.5	- 2 29.2	+ 3 0	12.1	- 2 40.1	9.857 9849	0.216 8385	0.216 0360	
	2	196	49	19.4	1 36 44.5	2 39.8	2 54	35.1	2 56.8	9.858 1346	0.215 2201	0.214 3908	
	4	200	2	43.3	1 36 39.3	2 48.3	2 48	25.2	3 12.9	9.858 2880	0.213 5480	0.212 6919	
	6	203	15	56.8	1 36 34.1	2 54.7	2 41	43.7	3 28.4	9.858 4446	0.211 8222	0.210 9388	
	8	206	28	59.6	1 36 28.7	2 58.9	2 34	31.9	3 43.2	9.858 6039	0.210 0416	0.209 1307	
	10	209	41	51.7	1 36 23.3	- 3 0.9	+ 2 26	51.3	- 3 57.2	9.858 7653	0.208 2061	0.207 2675	
	12	212	54	32.8	1 36 17.8	3 0.5	2 18	43.4	4 10.5	9.858 9285	0.206 3152	0.205 3492	
	14	216	7	2.9	1 36 12.3	2 58.0	2 10	9.7	4 22.9	9.859 0928	0.204 3696	0.203 3762	
	16	219	19	22.1	1 36 6.8	2 53.2	2 1	12.1	4 34.5	9.859 2578	0.202 3692	0.201 3488	
	18	222	31	30.3	1 36 1.4	2 46.2	1 51	52.1	4 45.3	9.859 4229	0.200 3150	0.199 2678	
	20	225	43	27.7	1 35 56.0	- 2 37.1	+ 1 42	11.6	- 4 55.1	9.859 5876	0.198 2073	0.197 1337	
	22	228	55	14.4	1 35 50.7	2 26.1	1 32	12.5	5 3.9	9.859 7514	0.196 0471	0.194 9474	
	24	232	6	50.7	1 35 45.6	2 13.3	1 21	56.7	5 11.7	9.859 9138	0.193 8346	0.192 7086	
	26	235	18	16.8	1 35 40.6	1 58.9	1 11	26.1	5 18.6	9.860 0742	0.191 5695	0.190 4172	
	28	238	29	33.0	1 35 35.7	1 43.0	1 0	42.7	5 24.5	9.860 2323	0.189 2520	0.188 0741	
Oct	30	241	40	39.6	1 35 30.9	- 1 25.8	+ 0 49	48.5	- 5 29.4	9.860 3875	0.186 8832	0.185 6790	
	2	244	51	37.0	1 35 26.5	- 1 7.6	+ 0 38	45.5	- 5 33.3	9.860 5393	0.184 4616	0.183 2309	

## VENUS.

## GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.			Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.			Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
	°	'	"			°	'	"			At Date.	At Intermediate Date.
Oct. 2	244	51	37.0	1 35 26.5	-1 7.6	+0 38	45.5	-5 33.3	9.860 5393	0.184 4616	0.183 2309	
4	248	2	25.7	1 35 22.2	0 48.6	0 27	35.8	5 36.1	9.860 6872	0.181 9869	0.180 7294	
6	251	13	6.2	1 35 18.3	0 29.0	0 16	21.5	5 37.9	9.860 8309	0.179 4583	0.178 1735	
8	254	23	38.8	1 35 14.4	-0 9.0	+0 5	4.6	5 38.7	9.860 9698	0.176 8749	0.175 5623	
10	257	34	4.1	1 35 10.9	+0 11.0	-0 6	12.8	5 38.5	9.861 1036	0.174 2356	0.172 8948	
12	260	44	22.7	1 35 7.7	+0 30.9	-0 17	28.7	-5 37.2	9.861 2318	0.171 5398	0.170 1707	
14	263	54	35.0	1 35 4.7	0 50.5	0 28	41.0	5 34.9	9.861 3541	0.168 7874	0.167 3902	
16	267	4	41.7	1 35 2.0	1 9.4	0 39	47.6	5 31.6	9.861 4701	0.165 9788	0.164 5532	
18	270	14	43.4	1 34 59.6	1 27.4	0 50	46.5	5 27.3	9.861 5794	0.163 1135	0.161 6598	
20	273	24	40.5	1 34 57.5	1 44.4	1 1	36.0	5 22.0	9.861 6818	0.160 1921	0.158 7103	
22	276	34	33.7	1 34 55.8	+2 0.0	-1 12	13.8	-5 15.7	9.861 7768	0.157 2144	0.155 7045	
24	279	44	23.7	1 34 54.2	2 14.2	1 22	38.1	5 8.5	9.861 8643	0.154 1805	0.152 6423	
26	282	54	10.8	1 34 53.0	2 26.8	1 32	47.1	5 0.4	9.861 9440	0.151 0900	0.149 5235	
28	286	3	55.8	1 34 52.1	2 37.6	1 42	38.9	4 51.3	9.862 0155	0.147 9427	0.146 3475	
30	289	13	39.1	1 34 51.4	2 46.4	1 52	11.8	4 41.4	9.862 0788	0.144 7379	0.143 1137	
Nov. 1	292	23	21.4	1 34 51.0	+2 53.3	-2 1	24.1	-4 30.7	9.862 1337	0.141 4748	0.139 8210	
3	295	33	3.2	1 34 50.9	2 58.0	2 10	14.1	4 19.1	9.862 1799	0.138 1520	0.136 4678	
5	298	42	44.9	1 34 51.0	3 0.5	2 18	40.2	4 6.8	9.862 2173	0.134 7680	0.133 0525	
7	301	52	27.1	1 34 51.3	3 0.9	2 26	40.9	3 53.8	9.862 2459	0.131 3211	0.129 5734	
9	305	2	10.2	1 34 51.9	2 59.0	2 34	14.9	3 40.0	9.862 2655	0.127 8095	0.126 0293	
11	308	11	54.7	1 34 52.7	+2 55.0	-2 41	20.6	-3 25.6	9.862 2760	0.124 2325	0.122 4190	
13	311	21	41.1	1 34 53.7	2 48.8	2 47	56.9	3 10.6	9.862 2775	0.120 5888	0.118 7417	
15	314	31	29.6	1 34 54.9	2 40.6	2 54	2.6	2 55.0	9.862 2699	0.116 8778	0.114 9970	
17	317	41	20.7	1 34 56.3	2 30.5	2 59	36.5	2 38.8	9.862 2533	0.113 0991	0.111 1840	
19	320	51	14.8	1 34 57.8	2 18.5	3 4	37.6	2 22.2	9.862 2277	0.109 2516	0.107 3020	
21	324	1	12.2	1 34 59.5	+2 4.8	-3 9	5.1	-2 5.1	9.862 1932	0.105 3351	0.103 3507	
23	327	11	13.1	1 35 1.4	1 49.6	3 12	58.0	1 47.6	9.862 1499	0.101 3488	0.099 3292	
25	330	21	17.8	1 35 3.4	1 33.0	3 16	15.6	1 29.9	9.862 0980	0.097 2919	0.095 2366	
27	333	31	26.7	1 35 5.5	1 15.3	3 18	57.4	1 11.8	9.862 0374	0.093 1633	0.091 0717	
29	336	41	39.9	1 35 7.7	0 56.7	3 21	2.7	0 53.5	9.861 9686	0.088 9616	0.086 8327	
Dec. 1	339	51	57.6	1 35 10.0	+0 37.4	-3 22	31.3	-0 35.0	9.861 8916	0.084 6847	0.082 5176	
3	343	2	20.0	1 35 12.4	+0 17.5	3 23	22.7	-0 16.4	9.861 8067	0.080 3308	0.078 1241	
5	346	12	47.3	1 35 14.9	-0 2.5	3 23	36.8	+0 2.3	9.861 7143	0.075 8970	0.073 6492	
7	349	23	19.7	1 35 17.4	0 22.5	3 23	13.5	0 21.0	9.861 6142	0.071 3805	0.069 0906	
9	352	33	57.2	1 35 20.0	0 42.2	3 22	12.9	0 39.7	9.861 5071	0.066 7792	0.064 4459	
11	355	44	40.0	1 35 22.7	-1 1.4	-3 20	34.8	+0 58.3	9.861 3934	0.062 0905	0.059 7128	
13	358	55	28.2	1 35 25.5	1 19.9	3 18	19.8	1 16.7	9.861 2731	0.057 3126	0.054 8897	
15	2	6	22.0	1 35 28.3	1 37.4	3 15	28.2	1 34.9	9.861 1469	0.052 4439	0.049 9749	
17	5	17	21.4	1 35 31.1	1 53.7	3 12	0.3	1 52.9	9.861 0149	0.047 4825	0.044 9665	
19	8	28	26.5	1 35 34.0	2 8.6	3 7	56.8	2 10.5	9.860 8777	0.042 4268	0.039 8631	
21	11	39	37.4	1 35 36.9	-2 21.9	-3 3	18.3	+2 27.8	9.860 7356	0.037 2752	0.034 6629	
23	14	50	54.1	1 35 39.8	2 33.5	2 58	5.6	2 44.7	9.860 5891	0.032 0260	0.029 3642	
25	18	2	16.8	1 35 42.9	2 43.2	2 52	19.8	3 1.0	9.860 4386	0.026 6773	0.023 9652	
27	21	13	45.6	1 35 45.9	2 50.9	2 46	1.7	3 16.9	9.860 2845	0.021 2274	0.018 4636	
29	24	25	20.5	1 35 48.9	2 56.5	2 39	12.4	3 32.2	9.860 1274	0.015 6733	0.012 8562	
31	27	37	1.5	1 35 52.0	-2 59.9	-2 31	53.2	+3 46.8	9.859 9678	0.010 0117	0.007 1393	
33	30	48	48.8	1 35 55.2	-3 1.0	-2 24	5.4	+4 0.8	9.859 8060	0.004 2385		

## MARS.

## GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.			Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.		Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth -		
	°	'	"			°	'			At Date.	At Intermediate Date.	
Jan.	0	339	52 18.5	38 4.06	- 36.1	- 1	43 36.9	+ 26.48	0.140 5195	0.310 8321	0.311 6817	
	2	341	8 25.7	38 3.09	37.8	1	42 42.5	27.98	0.140 6077	0.312 5294	0.313 3749	
	4	342	24 30.7	38 1.91	39.4	1	41 45.0	29.46	0.140 7139	0.314 2184	0.315 0601	
	6	343	40 33.3	38 0.61	41.0	1	40 44.6	30.93	0.140 8381	0.315 8999	0.316 7377	
	8	344	56 33.1	37 59.06	42.5	1	39 41.2	32.37	0.140 9802	0.317 5735	0.318 4075	
	10	346	12 29.5	37 57.34	- 43.9	- 1	38 34.8	+ 33.83	0.141 1401	0.319 2395	0.320 0693	
	12	347	28 22.4	37 55.46	45.2	1	37 25.9	35.23	0.141 3176	0.320 8971	0.321 7228	
	14	348	44 11.3	37 53.34	46.5	1	36 14.1	36.60	0.141 5126	0.322 5464	0.323 3672	
	16	349	59 55.7	37 51.09	47.6	1	34 59.5	37.95	0.141 7250	0.324 1858	0.325 0021	
	18	351	15 35.6	37 48.69	48.7	1	33 42.3	39.28	0.141 9547	0.325 8159	0.326 6274	
	20	352	31 10.4	37 46.04	- 49.7	- 1	32 22.4	+ 40.59	0.142 2015	0.327 4365	0.328 2430	
	22	353	46 39.7	37 43.21	50.5	1	31 0.0	41.85	0.142 4652	0.329 0470	0.329 8485	
	24	355	2 3.2	37 40.24	51.3	1	29 35.0	43.12	0.142 7457	0.330 6476	0.331 4442	
	26	356	17 20.6	37 37.11	51.9	1	28 7.5	44.32	0.143 0428	0.332 2383	0.333 0301	
	28	357	32 31.6	37 33.81	52.5	1	26 37.7	45.50	0.143 3563	0.333 8196	0.334 6068	
	30	358	47 35.8	37 30.36	- 52.9	- 1	25 5.5	+ 46.67	0.143 6859	0.335 3918	0.336 1747	
	Feb.	1	0	2 33.0	37 26.74	53.3	1	23 31.0	47.80	0.144 0314	0.336 9556	0.337 7341
		3	1	17 22.7	37 22.94	53.6	1	21 54.3	48.92	0.144 3926	0.338 5107	0.339 2852
5		2	32 4.7	37 19.02	53.7	1	20 15.4	49.97	0.144 7693	0.340 0577	0.340 8280	
7		3	46 38.7	37 14.91	53.8	1	18 34.4	50.97	0.145 1613	0.341 5961	0.342 3619	
9		5	1 4.3	37 10.66	- 53.7	- 1	16 51.5	+ 51.97	0.145 5682	0.343 1253	0.343 8861	
11		6	15 21.3	37 6.29	53.6	1	15 6.5	52.95	0.145 9899	0.344 6446	0.345 4004	
13		7	29 29.4	37 1.79	53.3	1	13 19.7	53.87	0.146 4260	0.346 1537	0.346 9040	
15		8	43 28.4	36 57.14	53.0	1	11 31.0	54.77	0.146 8763	0.347 6516	0.348 3963	
17		9	57 17.9	36 52.36	52.6	1	9 40.6	55.62	0.147 3405	0.349 1381	0.349 8769	
19		11	10 57.8	36 47.44	- 52.0	- 1	7 48.5	+ 56.45	0.147 8183	0.350 6127	0.351 3455	
21		12	24 27.6	36 42.39	51.4	1	5 54.8	57.22	0.148 3093	0.352 0752	0.352 8018	
23		13	37 47.3	36 37.24	50.7	1	3 59.6	57.97	0.148 8134	0.353 5254	0.354 2460	
25		14	50 56.5	36 31.99	49.8	1	2 2.9	58.70	0.149 3302	0.354 9635	0.355 6780	
27		16	3 55.2	36 26.64	49.0	1	0 4.8	59.37	0.149 8594	0.356 3895	0.357 0980	
29		17	16 43.0	36 21.14	- 48.0	- 0	58 5.4	+ 60.02	0.150 4006	0.357 8036	0.358 5064	
Mar.		2	18	29 19.7	36 15.54	46.9	0	56 4.7	60.65	0.150 9536	0.359 2064	0.359 9033
		4	19	41 45.1	36 9.84	45.7	0	54 2.8	61.22	0.151 5180	0.360 5973	0.361 2884
		6	20	53 59.0	36 4.06	44.5	0	51 59.8	61.75	0.152 0935	0.361 9766	0.362 6616
	8	22	6 1.3	35 58.18	43.2	0	49 55.8	62.25	0.152 6798	0.363 3435	0.364 0221	
	10	23	17 51.7	35 52.21	- 41.8	- 0	47 50.8	+ 62.77	0.153 2766	0.364 6973	0.365 3692	
	12	24	29 30.1	35 46.18	40.4	0	45 44.9	63.18	0.153 8834	0.366 0375	0.366 7021	
	14	25	40 56.3	35 40.05	38.9	0	43 38.1	63.57	0.154 5000	0.367 3630	0.368 0201	
	16	26	52 10.3	35 33.85	37.3	0	41 30.6	63.92	0.155 1260	0.368 6733	0.369 3227	
	18	28	3 11.8	35 27.60	35.6	0	39 22.4	64.25	0.155 7611	0.369 9681	0.370 6094	
	20	29	14 0.7	35 21.28	- 34.0	- 0	37 13.6	+ 64.55	0.156 4050	0.371 2467	0.371 8799	
	22	30	24 36.9	35 14.88	32.2	0	35 4.2	64.82	0.157 0572	0.372 5090	0.373 1338	
	24	31	35 0.2	35 8.43	30.4	0	32 54.3	65.05	0.157 7175	0.373 7545	0.374 3712	
	26	32	45 10.6	35 1.93	28.6	0	30 44.0	65.23	0.158 3856	0.374 9837	0.375 5921	
	28	33	55 7.9	34 55.38	26.7	0	28 33.4	65.40	0.159 0610	0.376 1965	0.376 7969	
	30	35	4 52.1	34 48.78	- 24.8	- 0	26 22.4	+ 65.55	0.159 7434	0.377 3932	0.377 9855	
	Apr. 1	36	14 23.0	34 42.13	- 22.9	- 0	24 11.2	+ 65.65	0.160 4326	0.378 5737	0.379 1579	



## MARS.

## GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.			Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.			Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
	°	'	"			°	'	"			At Date.	At Intermediate Date.
Apr.	1	36	14	23.0	34 42.13	— 22.9	— 0	24 11.2	+ 65.65	0.160 4326	0.378 5737	0.379 1579
	3	37	23	40.6	34 35.46	20.9	0	21 59.8	65.70	0.161 1281	0.379 7380	0.380 3137
	5	38	32	44.9	34 28.78	18.9	0	19 48.4	65.75	0.161 8296	0.380 8851	0.381 4524
	7	39	41	35.7	34 22.03	16.8	0	17 36.8	65.77	0.162 5368	0.382 0152	0.382 5732
	9	40	50	13.0	34 15.25	14.8	0	15 25.3	65.75	0.163 2493	0.383 1265	0.383 6752
	11	41	58	36.7	34 8.45	— 12.7	— 0	13 13.8	+ 65.70	0.163 9669	0.384 2191	0.384 7581
	13	43	6	46.8	34 1.62	10.7	0	11 2.5	65.62	0.164 6891	0.385 2921	0.385 8209
	15	44	14	43.2	33 54.80	8.6	0	8 51.3	65.52	0.165 4157	0.386 3446	0.386 8630
	17	45	22	26.0	33 47.97	6.5	0	6 40.4	65.38	0.166 1463	0.387 3762	0.387 8840
	19	46	29	55.1	33 41.12	4.4	0	4 29.8	65.22	0.166 8806	0.388 3866	0.388 8838
	21	47	37	10.5	33 34.37	— 2.2	— 0	2 19.5	+ 65.05	0.167 6183	0.389 3756	0.389 8619
	23	48	44	12.2	33 27.40	— 0.2	— 0	0 9.6	64.85	0.168 3590	0.390 3429	0.390 8186
	25	49	51	0.1	33 20.52	+ 1.9	+ 0	1 59.9	64.62	0.169 1025	0.391 2889	0.391 7538
	27	50	57	34.3	33 13.67	4.0	0	4 8.9	64.35	0.169 8485	0.392 2134	0.392 6678
	29	52	3	54.8	33 6.82	6.1	0	6 17.3	64.07	0.170 5966	0.393 1168	0.393 5604
May	1	53	10	1.6	32 59.97	+ 8.1	+ 0	8 25.2	+ 63.77	0.171 3465	0.393 9986	0.394 4315
	3	54	15	54.7	32 53.15	10.1	0	10 32.4	63.45	0.172 0979	0.394 8589	0.395 2806
	5	55	21	34.2	32 46.32	12.2	0	12 39.0	63.12	0.172 8506	0.395 6966	0.396 1069
	7	56	27	0.0	32 39.52	14.2	0	14 44.9	62.75	0.173 6042	0.396 5113	0.396 9098
	9	57	32	12.3	32 32.74	16.1	0	16 50.0	62.35	0.174 3585	0.397 3022	0.397 6885
	11	58	37	11.0	32 25.97	+ 18.0	+ 0	18 54.3	+ 61.93	0.175 1132	0.398 0686	0.398 4423
	13	59	41	56.2	32 19.24	19.9	0	20 57.7	61.50	0.175 8679	0.398 8097	0.399 1707
	15	60	46	28.0	32 12.52	21.8	0	23 0.3	61.07	0.176 6225	0.399 5251	0.399 8729
	17	61	50	46.3	32 5.82	23.7	0	25 2.0	60.62	0.177 3766	0.400 2141	0.400 5486
	19	62	54	51.3	31 59.17	25.4	0	27 2.8	60.15	0.178 1300	0.400 8764	0.401 1975
	21	63	58	43.0	31 52.57	+ 27.2	+ 0	29 2.6	+ 59.62	0.178 8825	0.401 5120	0.401 8198
	23	65	2	21.6	31 45.99	28.8	0	31 1.3	59.10	0.179 6337	0.402 1209	0.402 4154
	25	66	5	47.0	31 39.42	30.5	0	32 59.0	58.60	0.180 3834	0.402 7032	0.402 9845
	27	67	8	59.3	31 32.92	32.1	0	34 55.7	58.05	0.181 1313	0.403 2591	0.403 5271
	29	68	11	58.7	31 26.44	33.7	0	36 51.2	57.48	0.181 8773	0.403 7884	0.404 0429
	31	69	14	45.1	31 20.01	+ 35.2	+ 0	38 45.6	+ 56.90	0.182 6210	0.404 2906	0.404 5315
June	2	70	17	18.8	31 13.63	36.6	0	40 38.8	56.30	0.183 3623	0.404 7655	0.404 9926
	4	71	19	39.7	31 7.28	38.0	0	42 30.9	55.72	0.184 1009	0.405 2125	0.405 4251
	6	72	21	48.0	31 1.01	39.4	0	44 21.7	55.10	0.184 8366	0.405 6305	0.405 8286
	8	73	23	43.8	30 54.76	40.7	0	46 11.3	54.47	0.185 5692	0.406 0192	0.406 2023
	10	74	25	27.1	30 48.56	+ 41.9	+ 0	47 59.6	+ 53.85	0.186 2984	0.406 3777	0.406 5455
	12	75	26	58.1	30 42.43	43.1	0	49 46.7	53.20	0.187 0240	0.406 7055	0.406 8575
	14	76	28	16.9	30 36.33	44.2	0	51 32.4	52.53	0.187 7458	0.407 0016	0.407 1377
	16	77	29	23.5	30 30.28	45.3	0	53 16.8	51.87	0.188 4637	0.407 2658	0.407 3859
	18	78	30	18.1	30 24.31	46.3	0	54 59.9	51.20	0.189 1774	0.407 4980	0.407 6022
	20	79	31	0.9	30 18.41	+ 47.2	+ 0	56 41.6	+ 50.50	0.189 8868	0.407 6983	0.407 7864
	22	80	31	31.8	30 12.54	48.1	0	58 21.9	49.80	0.190 5915	0.407 8664	0.407 9385
	24	81	31	51.1	30 6.76	48.9	1	0 0.8	49.10	0.191 2916	0.408 0027	0.408 0588
	26	82	31	58.9	30 1.01	49.7	1	1 38.3	48.38	0.191 9866	0.408 1069	0.408 1471
	28	83	31	55.2	29 55.31	50.4	1	3 14.3	47.65	0.192 6766	0.408 1791	0.408 2030
	30	84	31	40.2	29 49.68	+ 51.0	+ 1	4 48.9	+ 46.95	0.193 3613	0.408 2186	0.408 2259
	July 2	85	31	14.0	29 44.13	+ 51.5	+ 1	6 22.1	+ 46.20	0.194 0405	0.408 2248	0.408 2152

MARS.												
GREENWICH MEAN NOON.												
Date.	Heliocentric Longitude, Mean Equinox of Date.			Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.			Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
	°	'	"			°	'	"			At Date.	At Intermediate Date.
July	2	85	31 14.0	29 44.13	+ 51.5	+ 1	6 22.1	+ 46.20	0.194 0405	0.408 2248	0.408 2152	
	4	86	30 36.8	29 34.66	52.0	1	7 53.7	45.47	0.194 7142	0.408 1971	0.408 1703	
	6	87	29 48.7	29 33.21	52.5	1	9 23.8	44.67	0.195 3820	0.408 1349	0.408 0905	
	8	88	28 59.7	29 27.84	52.8	1	10 52.5	43.92	0.196 0439	0.408 0371	0.407 9746	
	10	89	27 40.1	29 22.56	53.2	1	12 19.6	43.17	0.196 6997	0.407 9030	0.407 8223	
	12	90	26 20.0	29 17.31	+ 53.4	+ 1	13 45.2	+ 42.42	0.197 3493	0.407 7323	0.407 6331	
	14	91	24 49.4	29 12.13	53.6	1	15 9.3	41.65	0.197 9924	0.407 5244	0.407 4061	
	16	92	23 8.6	29 7.03	53.7	1	16 31.8	40.87	0.198 6291	0.407 2783	0.407 1411	
	18	93	21 17.6	29 2.01	53.8	1	17 52.8	40.10	0.199 2590	0.406 9944	0.406 8383	
	20	94	19 16.7	28 57.06	53.8	1	19 12.2	39.32	0.199 8822	0.406 6728	0.406 4980	
	22	95	17 5.9	28 52.16	+ 53.7	+ 1	20 30.1	+ 38.52	0.200 4984	0.406 3138	0.406 1201	
	24	96	14 45.4	28 47.35	53.6	1	21 46.3	37.73	0.201 1076	0.405 9169	0.405 7043	
	26	97	12 15.4	28 42.61	53.4	1	23 1.0	36.95	0.201 7096	0.405 4822	0.405 2504	
	28	98	9 35.9	28 37.91	53.2	1	24 14.1	36.15	0.202 3043	0.405 0090	0.404 7578	
	30	99	6 47.1	28 33.29	52.9	1	25 25.6	35.35	0.202 8915	0.404 4968	0.404 2260	
Aug.	1	100	3 49.1	28 28.76	+ 52.5	+ 1	26 35.5	+ 34.53	0.203 4712	0.403 9451	0.403 6540	
	3	101	0 42.2	28 24.31	52.1	1	27 43.7	33.72	0.204 0432	0.403 3526	0.403 0411	
	5	101	57 26.4	28 19.89	51.6	1	28 50.4	32.92	0.204 6075	0.402 7193	0.402 3869	
	7	102	54 1.8	28 15.59	51.1	1	29 55.4	32.10	0.205 1639	0.402 0438	0.401 6899	
	9	103	50 28.8	28 11.36	50.5	1	30 58.8	31.30	0.205 7123	0.401 3253	0.400 9500	
	11	104	46 47.3	28 7.14	+ 49.9	+ 1	32 0.6	+ 30.50	0.206 2527	0.400 5637	0.400 1662	
	13	105	42 57.4	28 3.04	49.2	1	33 0.8	29.68	0.206 7849	0.399 7577	0.399 3382	
	15	106	38 59.4	27 59.04	48.5	1	33 59.3	28.85	0.207 3088	0.398 9077	0.398 4661	
	17	107	34 53.6	27 55.09	47.7	1	34 56.2	28.05	0.207 8243	0.398 0134	0.397 5497	
	19	108	30 39.9	27 51.19	46.9	1	35 51.5	27.25	0.208 3314	0.397 0750	0.396 5892	
	21	109	26 18.4	27 47.36	+ 46.0	+ 1	36 45.2	+ 26.42	0.208 8300	0.396 0923	0.395 5843	
	23	110	21 49.4	27 43.66	45.1	1	37 37.2	25.58	0.209 3200	0.395 0651	0.394 5347	
	25	111	17 13.1	27 40.01	44.1	1	38 27.5	24.75	0.209 8012	0.393 9930	0.393 4399	
	27	112	12 29.5	27 36.41	43.1	1	39 16.2	23.95	0.210 2738	0.392 8754	0.392 2993	
	29	113	7 38.8	27 32.89	42.0	1	40 3.3	23.15	0.210 7374	0.391 7116	0.391 1121	
31	114	2 41.1	27 29.44	+ 40.9	+ 1	40 48.8	+ 22.32	0.211 1922	0.390 5006	0.389 8773		
Sept.	2	114	57 36.6	27 26.09	39.8	1	41 32.6	21.50	0.211 6379	0.389 2419	0.388 5943	
	4	115	52 25.5	27 22.81	38.6	1	42 14.8	20.67	0.212 0746	0.387 9343	0.387 2618	
	6	116	47 7.9	27 19.59	37.4	1	42 55.3	19.85	0.212 5022	0.386 5768	0.385 8793	
	8	117	41 43.9	27 16.46	36.2	1	43 34.2	19.02	0.212 9206	0.385 1690	0.384 4458	
	10	118	36 13.8	27 13.41	+ 34.9	+ 1	44 11.4	+ 18.22	0.213 3297	0.383 7097	0.382 9606	
	12	119	30 37.6	27 10.41	33.6	1	44 47.1	17.42	0.213 7295	0.382 1987	0.381 4239	
	14	120	24 55.5	27 7.51	32.2	1	45 21.1	16.58	0.214 1199	0.380 6362	0.379 8355	
	16	121	19 7.7	27 4.66	30.9	1	45 53.4	15.75	0.214 5009	0.379 0219	0.378 1953	
	18	122	13 14.2	27 1.89	29.5	1	46 24.1	14.97	0.214 8724	0.377 3557	0.376 5032	
	20	123	7 15.3	26 59.21	+ 28.0	+ 1	46 53.2	+ 14.16	0.215 2344	0.375 6376	0.374 7588	
	22	124	1 11.1	26 56.61	26.6	1	47 20.7	13.35	0.215 5868	0.373 8668	0.372 9615	
	24	124	55 1.8	26 54.09	25.1	1	47 46.6	12.52	0.215 9296	0.372 0428	0.371 1105	
	26	125	48 47.5	26 51.61	23.6	1	48 10.8	11.70	0.216 2627	0.370 1647	0.369 2053	
	28	126	42 28.3	26 49.21	22.1	1	48 33.4	10.90	0.216 5861	0.368 2321	0.367 2448	
	30	127	36 4.4	26 46.91	+ 20.5	+ 1	48 54.4	+ 10.10	0.216 8997	0.366 2435	0.365 2281	
Oct.	2	128	29 36.0	26 44.68	+ 19.0	+ 1	49 13.8	+ 9.30	0.217 2035	0.364 1984	0.363 1541	

## MARS.

## GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.			Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.			Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
	°	'	"			°	'	"			At Date.	At Intermediate Date.
Oct.	2	128 29	36.0	26 44.68	+ 19.0	+ 1 49	13.8		+ 9.30	0.217 2035	0.364 1984	0.363 1541
	4	129 23	3.2	26 42.51	17.4	1 49	31.6		8.47	0.217 4975	0.362 0951	0.361 0215
	6	130 16	26.1	26 40.41	15.8	1 49	47.7		7.65	0.217 7816	0.359 9330	0.358 8295
	8	131 9	44.9	26 38.41	14.2	1 50	2.2		6.87	0.218 0558	0.357 7110	0.356 5775
	10	132 2	59.8	26 36.48	12.6	1 50	15.2		6.10	0.218 3200	0.355 4289	0.354 2651
	12	132 56	10.9	26 34.64	+ 11.0	+ 1 50	26.6		+ 5.30	0.218 5742	0.353 0862	0.351 8921
	14	133 49	18.3	26 32.84	9.3	1 50	36.4		4.48	0.218 8184	0.350 6829	0.349 4586
	16	134 42	22.3	26 31.14	7.7	1 50	44.5		3.67	0.219 0526	0.348 2190	0.346 9641
	18	135 35	22.9	26 29.49	6.1	1 50	51.1		2.90	0.219 2767	0.345 6939	0.344 4083
	20	136 28	20.3	26 27.91	4.4	1 50	56.1		2.10	0.219 4907	0.343 1072	0.341 7906
	22	137 21	14.6	26 26.44	+ 2.8	+ 1 50	59.5		+ 1.32	0.219 6946	0.340 4584	0.339 1104
	24	138 14	6.1	26 25.04	+ 1.1	1 51	1.4		+ 0.55	0.219 8883	0.337 7465	0.336 3666
	26	139 6	54.8	26 23.69	- 0.5	1 51	1.7		- 0.25	0.220 0718	0.334 9707	0.333 5585
	28	139 59	40.9	26 22.42	2.2	1 51	0.4		1.05	0.220 2451	0.332 1298	0.330 6846
	30	140 52	24.5	26 21.22	3.8	1 50	57.5		1.82	0.220 4082	0.329 2227	0.327 7440
Nov.	1	141 45	5.8	26 20.12	- 5.5	+ 1 50	53.1		- 2.60	0.220 5611	0.326 2482	0.324 7352
	3	142 37	45.0	26 19.09	7.1	1 50	47.1		3.40	0.220 7038	0.323 2049	0.321 6572
	5	143 30	22.2	26 18.14	8.7	1 50	39.5		4.17	0.220 8361	0.320 0920	0.318 5092
	7	144 22	57.6	26 17.27	10.3	1 50	30.4		4.92	0.220 9582	0.316 9087	0.315 2904
	9	145 15	31.3	26 16.42	12.0	1 50	19.8		5.70	0.221 0700	0.313 6544	0.312 0007
	11	146 8	3.3	26 15.65	- 13.6	+ 1 50	7.6		- 6.48	0.221 1714	0.310 3292	0.308 6399
	13	147 0	33.9	26 14.99	15.1	1 49	53.9		7.27	0.221 2625	0.306 9327	0.305 2076
	15	147 53	3.3	26 14.41	16.7	1 49	38.7		8.00	0.221 3433	0.303 4645	0.301 7034
	17	148 45	31.6	26 13.91	18.3	1 49	21.9		8.77	0.221 4138	0.299 9243	0.298 1271
	19	149 37	59.0	26 13.46	19.8	1 49	3.6		9.52	0.221 4740	0.296 3115	0.294 4774
	21	150 30	25.5	26 13.08	21.3	+ 1 48	43.8		- 10.27	0.221 5237	0.292 6248	0.290 7536
	23	151 22	51.4	26 12.78	22.8	1 48	22.5		11.02	0.221 5631	0.288 8636	0.286 9546
	25	152 15	16.7	26 12.56	24.3	1 47	59.7		11.77	0.221 5921	0.285 0264	0.283 0791
	27	153 7	41.7	26 12.41	25.8	1 47	35.4		12.52	0.221 6108	0.281 1123	0.279 1257
Dec.	29	154 0	6.4	26 12.35	27.2	1 47	9.6		13.27	0.221 6190	0.277 1191	0.275 0927
	1	154 52	31.1	26 12.36	- 28.6	+ 1 46	42.3		- 14.02	0.221 6170	0.273 0462	0.270 9791
	3	155 44	55.9	26 12.43	30.0	1 46	13.5		14.77	0.221 6045	0.268 8916	0.266 7836
	5	156 37	20.9	26 12.58	31.3	1 45	43.2		15.52	0.221 5817	0.264 6550	0.262 5056
	7	157 29	46.3	26 12.81	32.6	1 45	11.4		16.25	0.221 5485	0.260 3355	0.258 1446
	9	158 22	12.2	26 13.09	33.9	1 44	38.2		16.98	0.221 5049	0.255 9328	0.253 7002
	11	159 14	38.7	26 13.46	- 35.2	+ 1 44	3.5		- 17.72	0.221 4510	0.251 4467	0.249 1722
	13	160 7	6.1	26 13.93	36.4	1 43	27.3		18.45	0.221 3867	0.246 8767	0.244 5601
	15	160 59	34.5	26 14.48	37.6	1 42	49.7		19.17	0.221 3121	0.242 2224	0.239 8635
	17	161 52	4.1	26 15.08	38.8	1 42	10.6		19.90	0.221 2271	0.237 4832	0.235 0815
	19	162 44	34.9	26 15.73	39.9	1 41	30.1		20.60	0.221 1319	0.232 6581	0.230 2131
	21	163 37	7.1	26 16.46	- 40.9	+ 1 40	48.2		- 21.32	0.221 0263	0.227 7461	0.225 2572
	23	164 29	40.8	26 17.29	42.0	1 40	4.8		22.05	0.220 9104	0.222 7460	0.220 2124
	25	165 22	16.3	26 18.21	43.0	1 39	20.0		22.78	0.220 7842	0.217 6562	0.215 0770
	27	166 14	53.7	26 19.19	44.0	1 38	33.7		23.50	0.220 6477	0.212 4747	0.209 8492
	29	167 7	33.1	26 20.24	44.9	1 37	46.0		24.18	0.220 5010	0.207 2004	0.204 5277
	31	168 0	14.7	26 21.36	- 45.8	+ 1 36	57.0		- 24.87	0.220 3440	0.201 8314	0.199 1111
	33	168 52	58.6	26 22.54	- 46.6	+ 1 36	6.5		- 25.60	0.220 1769	0.196 3669	

## JUPITER.

## GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.			Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.			Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
	°	'	"			°	'	"			At Date.	At Intermediate Date
Jan. 2	358	32	38.1	5 29.18	+ 10.1	17	7.9		- 1.42	0.695 3330	0.720 4753	0.722 8663
6	358	54	34.8	5 29.22	9.8	17	13.5		1.38	0.695 3028	0.725 2132	0.727 5152
10	359	16	31.8	5 29.26	9.4	17	18.9		1.33	0.695 2735	0.729 7709	0.731 9790
14	359	38	29.0	5 29.31	9.1	17	24.2		1.28	0.695 2449	0.734 1384	0.736 2479
18	0	0	26.3	5 29.35	8.8	17	29.2		1.24	0.695 2171	0.738 3065	0.740 3129
22	0	22	23.8	5 29.39	+ 8.5	17	34.0		- 1.19	0.695 1901	0.742 2665	0.744 1665
26	0	44	21.5	5 29.43	8.2	17	38.7		1.14	0.695 1639	0.746 0122	0.747 8031
30	1	6	19.3	5 29.47	7.8	17	43.2		1.09	0.695 1386	0.749 5390	0.751 2195
Feb. 3	1	28	17.3	5 29.51	7.4	17	47.4		1.04	0.695 1141	0.752 8442	0.754 4129
7	1	50	15.4	5 29.55	7.1	17	51.5		1.00	0.695 0903	0.755 9252	0.757 3805
11	2	12	13.6	5 29.58	+ 6.8	17	55.4		- 0.95	0.695 0673	0.758 7784	0.760 1183
15	2	34	12.0	5 29.61	6.5	17	59.1		0.90	0.695 0451	0.761 3998	0.762 6224
19	2	56	10.5	5 29.65	6.1	18	2.7		0.86	0.695 0237	0.763 7860	0.764 8901
23	3	18	9.2	5 29.68	5.8	18	6.0		0.81	0.695 0031	0.765 9348	0.766 9201
27	3	40	8.0	5 29.71	5.4	18	9.1		0.76	0.694 9833	0.767 8460	0.768 7126
Mar. 2	4	2	6.9	5 29.74	+ 5.1	18	12.1		- 0.71	0.694 9643	0.769 5199	0.770 2683
6	4	24	5.9	5 29.77	4.7	18	14.8		0.66	0.694 9461	0.770 9574	0.771 5871
10	4	46	5.1	5 29.80	4.4	18	17.4		0.62	0.694 9288	0.772 1574	0.772 6679
14	5	8	4.3	5 29.82	4.1	18	19.7		0.57	0.694 9123	0.773 1186	0.773 5094
18	5	30	3.6	5 29.84	3.7	18	21.9		0.52	0.694 8966	0.773 8403	0.774 1111
22	5	52	3.1	5 29.86	+ 3.4	18	23.9		- 0.47	0.694 8817	0.774 3221	0.774 4733
26	6	14	2.6	5 29.89	3.0	18	25.7		0.42	0.694 8676	0.774 5651	0.774 5980
30	6	36	2.2	5 29.91	2.7	18	27.3		0.37	0.694 8542	0.774 5721	0.774 4878
Apr. 3	6	58	1.9	5 29.93	2.4	18	28.7		0.33	0.694 8417	0.774 3449	0.774 1437
7	7	20	1.6	5 29.95	2.0	18	29.9		0.28	0.694 8300	0.773 8840	0.773 5659
11	7	42	1.4	5 29.96	+ 1.7	18	30.9		- 0.23	0.694 8191	0.773 1893	0.772 7542
15	8	4	1.3	5 29.98	1.3	18	31.7		0.18	0.694 8091	0.772 2609	0.771 7093
19	8	26	1.3	5 29.99	1.0	18	32.4		0.13	0.694 7999	0.771 0999	0.770 4328
23	8	48	1.3	5 30.00	0.7	18	32.8		0.09	0.694 7915	0.769 7086	0.768 9278
27	9	10	1.3	5 30.02	+ 0.3	18	33.1		- 0.04	0.694 7839	0.768 0907	0.767 1976
May 1	9	32	1.4	5 30.03	0.0	18	33.1		+ 0.01	0.694 7771	0.766 2487	0.765 2444
5	9	54	1.5	5 30.04	- 0.4	18	33.0		0.06	0.694 7711	0.764 1846	0.763 0695
9	10	16	1.7	5 30.04	0.7	18	32.7		0.10	0.694 7660	0.761 8991	0.760 6737
13	10	38	1.9	5 30.05	1.0	18	32.2		0.15	0.694 7617	0.759 3935	0.758 0589
17	11	0	2.1	5 30.05	1.4	18	31.5		0.20	0.694 7582	0.756 6703	0.755 2283
21	11	22	2.3	5 30.06	- 1.7	18	30.6		+ 0.25	0.694 7555	0.753 7332	0.752 1861
25	11	44	2.6	5 30.06	2.0	18	29.5		0.30	0.694 7535	0.750 5875	0.748 9379
29	12	6	2.8	5 30.07	2.4	18	28.2		0.34	0.694 7523	0.747 2377	0.745 4876
June 2	12	28	3.1	5 30.07	2.7	18	26.7		0.39	0.694 7520	0.743 6878	0.741 8386
6	12	50	3.4	5 30.07	3.1	18	25.0		0.44	0.694 7525	0.739 9405	0.737 9939
10	13	12	3.7	5 30.06	- 3.4	18	23.1		+ 0.49	0.694 7538	0.735 9997	0.733 9584
14	13	34	3.9	5 30.06	3.8	18	21.1		0.54	0.694 7560	0.731 8710	0.729 7383
18	13	56	4.1	5 30.05	4.1	18	18.8		0.59	0.694 7590	0.727 5616	0.725 3421
22	14	18	4.3	5 30.05	4.4	18	16.4		0.64	0.694 7628	0.723 0808	0.720 7789
26	14	40	4.5	5 30.04	4.8	18	13.7		0.68	0.694 7674	0.718 4374	0.716 0573
30	15	2	4.7	5 30.03	- 5.1	18	10.9		+ 0.73	0.694 7728	0.713 6396	0.711 1853
July 4	15	24	4.8	5 30.02	- 5.5	18	7.9		+ 0.78	0.694 7790	0.708 6957	0.706 1721

## JUPITER.

## GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.			Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.		Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—		
	°	'	"			°	"			At Date.	At Interme- diate Date.	
July	4	15	24	4.8	5	30.02	— 5.5	1 18 7.9	+ 0.78	0.694 7790	0.708 6957	0.706 1721
	8	15	46	4.8	5	30.01	5.8	1 18 4.7	0.83	0.694 7861	0.703 6160	0.701 0286
	12	16	8	4.8	5	30.00	6.2	1 18 1.3	0.87	0.694 7940	0.698 4121	0.695 7682
	16	16	30	4.8	5	29.98	6.5	1 17 57.7	0.92	0.694 8027	0.693 0993	0.690 4075
	20	16	52	4.7	5	29.97	6.8	1 17 53.9	0.97	0.694 8122	0.687 6950	0.684 9642
Aug.	24	17	14	4.5	5	29.96	— 7.1	1 17 49.9	+ 1.02	0.694 8225	0.682 2173	0.679 4562
	28	17	36	4.3	5	29.94	7.5	1 17 45.7	1.07	0.694 8335	0.676 6835	0.673 9015
	1	17	58	4.0	5	29.92	7.8	1 17 41.4	1.11	0.694 8454	0.671 1127	0.668 3199
	5	18	20	3.7	5	29.89	8.1	1 17 36.8	1.16	0.694 8581	0.665 5264	0.662 7353
	9	18	42	3.2	5	29.87	8.5	1 17 32.1	1.21	0.694 8717	0.659 9499	0.657 1731
	13	19	4	2.7	5	29.85	— 8.8	1 17 27.2	+ 1.26	0.694 8861	0.654 4090	0.651 6612
	17	19	26	2.0	5	29.83	9.1	1 17 22.0	1.30	0.694 9013	0.648 9343	0.646 2327
	21	19	48	1.3	5	29.81	9.5	1 17 16.7	1.35	0.694 9173	0.643 5599	0.640 9196
	25	20	10	0.5	5	29.78	9.8	1 17 11.2	1.40	0.694 9341	0.638 3158	0.635 7524
	29	20	31	59.6	5	29.75	10.1	1 17 5.5	1.45	0.694 9517	0.633 2338	0.630 7642
	Sept. 2	20	53	58.5	5	29.73	— 10.4	1 16 59.7	+ 1.49	0.694 9701	0.628 3483	0.625 9908
	6	21	15	57.4	5	29.70	10.7	1 16 53.6	1.54	0.694 9893	0.623 6967	0.621 4707
	10	21	37	56.1	5	29.67	11.0	1 16 47.3	1.59	0.695 0094	0.619 3179	0.617 2435
	14	21	59	54.7	5	29.63	11.3	1 16 40.9	1.63	0.695 0302	0.615 2518	0.613 3479
	18	22	21	53.2	5	29.60	11.6	1 16 34.3	1.68	0.695 0518	0.611 5353	0.609 8190
Oct.	22	22	43	51.5	5	29.57	— 12.0	1 16 27.5	+ 1.72	0.695 0742	0.608 2027	0.606 6903
	26	23	5	49.7	5	29.53	12.3	1 16 20.5	1.77	0.695 0974	0.605 2857	0.603 9927
	30	23	27	47.8	5	29.49	12.6	1 16 13.3	1.82	0.695 1214	0.602 8148	0.601 7555
	4	23	49	45.7	5	29.45	12.9	1 16 5.9	1.87	0.695 1462	0.600 8180	0.600 0058
	8	24	11	43.4	5	29.42	13.2	1 15 58.4	1.91	0.695 1718	0.599 3212	0.598 7673
	12	24	33	41.0	5	29.38	— 13.5	1 15 50.6	+ 1.96	0.695 1982	0.598 3453	0.598 0567
	16	24	55	38.4	5	29.34	13.8	1 15 42.7	2.00	0.695 2255	0.597 9027	0.597 8839
	20	25	17	35.7	5	29.30	14.1	1 15 34.6	2.05	0.695 2535	0.598 0003	0.598 2510
	24	25	39	32.8	5	29.25	14.4	1 15 26.3	2.10	0.695 2823	0.598 6356	0.599 1535
	28	26	1	29.7	5	29.20	14.7	1 15 17.8	2.14	0.695 3119	0.599 8034	0.600 5843
Nov.	1	26	23	26.4	5	29.16	— 15.0	1 15 9.2	+ 2.19	0.695 3423	0.601 4942	0.602 5317
	5	26	45	22.9	5	29.11	15.3	1 15 0.3	2.23	0.695 3735	0.603 6939	0.604 9785
	9	27	7	19.2	5	29.06	15.6	1 14 51.3	2.28	0.695 4054	0.606 3817	0.607 9004
	13	27	29	15.4	5	29.01	15.8	1 14 42.1	2.32	0.695 4381	0.609 5302	0.611 2670
	17	27	51	11.3	5	28.96	16.1	1 14 32.7	2.37	0.695 4716	0.613 1062	0.615 0434
	21	28	13	7.0	5	28.91	— 16.3	1 14 23.1	+ 2.41	0.695 5059	0.617 0741	0.619 1937
	25	28	35	2.6	5	28.85	16.6	1 14 13.4	2.46	0.695 5410	0.621 3975	0.623 6810
	29	28	56	57.9	5	28.80	16.9	1 14 3.4	2.50	0.695 5769	0.626 0397	0.628 4691
	Dec. 3	29	18	52.9	5	28.74	17.1	1 13 53.3	2.55	0.695 6136	0.630 9643	0.633 5204
	7	29	40	47.8	5	28.68	17.4	1 13 43.0	2.59	0.695 6510	0.636 1324	0.638 7954
	11	30	2	42.4	5	28.62	— 17.6	1 13 32.6	+ 2.64	0.695 6891	0.641 5043	0.644 2538
	15	30	24	36.8	5	28.57	17.9	1 13 21.9	2.68	0.695 7279	0.647 0394	0.649 8561
	19	30	46	30.9	5	28.51	18.2	1 13 11.1	2.72	0.695 7675	0.652 6998	0.655 5660
	23	31	8	24.8	5	28.44	18.4	1 13 0.1	2.77	0.695 8079	0.658 4508	0.661 3501
	27	31	30	18.5	5	28.38	18.7	1 12 49.0	2.81	0.695 8491	0.664 2604	0.667 1781
	31	31	52	11.9	5	28.32	— 18.9	1 12 37.6	+ 2.86	0.695 8911	0.670 0996	0.673 0216
	35	32	14	5.0	5	28.25	— 19.2	1 12 26.1	+ 2.90	0.695 9340	0.675 9403	

## SATURN.

## GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.			Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.			Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
	°	'	"			°	'	"			At Date.	At Intermediate Date.
Jan. 2	310	47	36.1	1 51.09	+ 0 57.3	— 0	46	2.6	— 4.59	0.997 2785	1.033 3971	1.033 9909
6	310	55	0.5	1 51.11	0 57.7	0	46	20.9	4.59	0.997 2436	1.034 5460	1.035 0620
10	311	2	24.9	1 51.13	0 58.0	0	46	39.3	4.58	0.997 2086	1.035 5386	1.035 9754
14	311	9	49.5	1 51.15	0 58.4	0	46	57.6	4.58	0.997 1735	1.036 3719	1.036 7277
18	311	17	14.1	1 51.17	0 58.7	0	47	15.9	4.58	0.997 1382	1.037 0426	1.037 3164
22	311	24	38.8	1 51.19	+ 0 59.1	— 0	47	34.2	— 4.58	0.997 1028	1.037 5491	1.037 7404
26	311	32	3.6	1 51.20	0 59.4	0	47	52.5	4.57	0.997 0673	1.037 8903	1.037 9989
30	311	39	28.5	1 51.22	0 59.7	0	48	10.8	4.57	0.997 0318	1.038 0663	1.038 0926
Feb. 3	311	46	53.4	1 51.24	1 0.0	0	48	29.1	4.57	0.996 9962	1.038 0778	1.038 0218
7	311	54	18.4	1 51.26	1 0.3	0	48	47.4	4.57	0.996 9605	1.037 9246	1.037 7863
11	312	1	43.5	1 51.28	+ 1 0.6	— 0	49	5.7	— 4.56	0.996 9247	1.037 6069	1.037 3863
15	312	9	8.6	1 51.29	1 1.0	0	49	23.9	4.56	0.996 8888	1.037 1247	1.036 8223
19	312	16	33.8	1 51.31	1 1.3	0	49	42.2	4.56	0.996 8528	1.036 4794	1.036 0960
23	312	23	59.1	1 51.33	1 1.7	0	50	0.4	4.56	0.996 8167	1.035 6727	1.035 2100
27	312	31	24.4	1 51.34	1 2.0	0	50	18.6	4.55	0.996 7806	1.034 7083	1.034 1680
Mar. 2	312	38	49.8	1 51.36	+ 1 2.4	— 0	50	36.8	— 4.55	0.996 7444	1.033 5894	1.032 9729
6	312	46	15.3	1 51.38	1 2.7	0	50	55.0	4.55	0.996 7081	1.032 3188	1.031 6275
10	312	53	40.9	1 51.40	1 3.0	0	51	13.2	4.55	0.996 6717	1.030 8993	1.030 1347
14	313	1	6.6	1 51.42	1 3.3	0	51	31.4	4.54	0.996 6352	1.029 3343	1.028 4985
18	313	8	32.3	1 51.44	1 3.6	0	51	49.5	4.54	0.996 5986	1.027 6279	1.026 7233
22	313	15	58.1	1 51.45	+ 1 4.0	— 0	52	7.7	— 4.54	0.996 5619	1.025 7853	1.024 8148
26	313	23	24.0	1 51.47	1 4.3	0	52	25.8	4.54	0.996 5251	1.023 8126	1.022 7796
30	313	30	49.9	1 51.49	1 4.6	0	52	44.0	4.53	0.996 4882	1.021 7165	1.020 6241
Apr. 3	313	38	15.9	1 51.51	1 4.9	0	53	2.1	4.53	0.996 4512	1.019 5030	1.018 3539
7	313	45	42.0	1 51.53	1 5.2	0	53	20.2	4.53	0.996 4142	1.017 1778	1.015 9754
11	313	53	8.1	1 51.55	+ 1 5.5	— 0	53	38.3	— 4.52	0.996 3771	1.014 7478	1.013 4958
15	314	0	34.4	1 51.57	1 5.8	0	53	56.4	4.52	0.996 3399	1.012 2206	1.010 9231
19	314	8	0.7	1 51.59	1 6.1	0	54	14.4	4.52	0.996 3026	1.009 6047	1.008 2665
23	314	15	27.1	1 51.61	1 6.4	0	54	32.5	4.51	0.996 2652	1.006 9099	1.005 5360
27	314	22	53.6	1 51.63	1 6.7	0	54	50.6	4.51	0.996 2276	1.004 1462	1.002 7417
May 1	314	30	20.2	1 51.65	+ 1 7.1	— 0	55	8.6	— 4.51	0.996 1900	1.001 3236	0.999 8930
5	314	37	46.8	1 51.67	1 7.4	0	55	26.6	4.50	0.996 1523	0.998 4514	0.996 9999
9	314	45	13.5	1 51.68	1 7.7	0	55	44.6	4.50	0.996 1145	0.995 5400	0.994 0731
13	314	52	40.3	1 51.70	1 8.0	0	56	2.6	4.50	0.996 0767	0.992 6008	0.991 1248
17	315	0	7.1	1 51.72	1 8.3	0	56	20.6	4.49	0.996 0388	0.989 6468	0.988 1684
21	315	7	34.1	1 51.74	+ 1 8.6	— 0	56	38.6	— 4.49	0.996 0008	0.986 6913	0.985 2173
25	315	15	1.1	1 51.76	1 8.9	0	56	56.5	4.49	0.995 9627	0.983 7479	0.982 2849
29	315	22	28.2	1 51.78	1 9.2	0	57	14.4	4.48	0.995 9245	0.980 8299	0.979 3843
June 2	315	29	55.3	1 51.80	1 9.5	0	57	32.4	4.48	0.995 8862	0.977 9498	0.976 5281
6	315	37	22.6	1 51.82	1 9.8	0	57	50.3	4.48	0.995 8477	0.975 1211	0.973 7308
10	315	44	49.8	1 51.84	+ 1 10.1	— 0	58	8.2	— 4.47	0.995 8092	0.972 3589	0.971 0073
14	315	52	17.2	1 51.86	1 10.4	0	58	26.1	4.47	0.995 7706	0.969 6780	0.968 3730
18	315	59	44.7	1 51.88	1 10.7	0	58	44.0	4.47	0.995 7320	0.967 0944	0.965 8439
22	316	7	12.2	1 51.90	1 11.0	0	59	1.8	4.46	0.995 6933	0.964 6232	0.963 4340
26	316	14	40.0	1 51.92	1 11.2	0	59	19.7	4.46	0.995 6546	0.962 2779	0.961 1566
30	316	22	7.7	1 51.94	+ 1 11.5	— 0	59	37.5	— 4.46	0.995 6158	0.960 0717	0.959 0247
July 4	316	29	35.5	1 51.96	+ 1 11.8	— 0	59	55.4	— 4.45	0.995 5768	0.958 0174	0.957 0517

## SATURN.

## GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.			Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.			Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
	°	'	"			°	'	"			At Date.	At Intermediate Date.
July 4	316	29	35.5	1 51.96	+ 1 11.8	— 0	59	55.4	— 4.45	0.995 5768	0.958 0174	0.957 0517
8	316	37	3.4	1 51.98	1 12.1	1	0	13.2	4.45	0.995 5377	0.956 1289	0.955 2508
12	316	44	31.3	1 52.00	1 12.4	1	0	31.0	4.45	0.995 4985	0.954 4189	0.953 6350
16	316	51	59.3	1 52.02	1 12.6	1	0	48.8	4.45	0.995 4591	0.952 9003	0.952 2163
20	316	59	27.4	1 52.04	1 12.9	1	1	6.6	4.44	0.995 4197	0.951 5838	0.951 0040
24	317	6	55.6	1 52.06	+ 1 13.2	— 1	1	24.3	— 4.44	0.995 3803	0.950 4776	0.950 0056
28	317	14	23.9	1 52.08	1 13.5	1	1	42.1	4.43	0.995 3408	0.949 5889	0.949 2280
Aug. 1	317	21	52.2	1 52.10	1 13.8	1	1	59.8	4.43	0.995 3013	0.948 9237	0.948 6765
5	317	29	20.7	1 52.12	1 14.0	1	2	17.5	4.42	0.995 2617	0.948 4870	0.948 3560
9	317	36	49.2	1 52.14	1 14.3	1	2	35.2	4.42	0.995 2220	0.948 2837	0.948 2704
13	317	44	17.8	1 52.16	+ 1 14.6	— 1	2	52.9	— 4.42	0.995 1822	0.948 3160	0.948 4207
17	317	51	46.4	1 52.18	1 14.9	1	3	10.6	4.41	0.995 1423	0.948 5841	0.948 8058
21	317	59	15.2	1 52.20	1 15.2	1	3	28.2	4.41	0.995 1022	0.949 0852	0.949 4218
25	318	6	44.0	1 52.22	1 15.4	1	3	45.9	4.41	0.995 0620	0.949 8149	0.950 2639
29	318	14	12.9	1 52.24	1 15.7	1	4	3.5	4.40	0.995 0218	0.950 7680	0.951 3265
Sept. 2	318	21	41.9	1 52.26	+ 1 16.0	— 1	4	21.1	— 4.40	0.994 9815	0.951 9384	0.952 6030
6	318	29	11.0	1 52.28	1 16.2	1	4	38.7	4.40	0.994 9412	0.953 3190	0.954 0855
10	318	36	40.1	1 52.30	1 16.5	1	5	56.3	4.39	0.994 9008	0.954 9010	0.955 7642
14	318	44	9.4	1 52.32	1 16.7	1	5	13.9	4.39	0.994 8604	0.956 6734	0.957 6269
18	318	51	38.7	1 52.34	1 17.0	1	5	31.4	4.38	0.994 8199	0.958 6231	0.959 6602
22	318	59	8.1	1 52.36	+ 1 17.3	— 1	5	48.9	— 4.38	0.994 7793	0.960 7364	0.961 8500
26	319	6	37.6	1 52.38	1 17.5	1	6	6.5	4.38	0.994 7385	0.962 9994	0.964 1828
30	319	14	7.2	1 52.40	1 17.8	1	6	24.0	4.37	0.994 6976	0.965 3986	0.966 6450
Oct. 4	319	21	36.8	1 52.42	1 18.0	1	6	41.5	4.37	0.994 6566	0.967 9201	0.969 2222
8	319	29	6.6	1 52.44	1 18.3	1	6	58.9	4.37	0.994 6156	0.970 5493	0.971 8995
12	319	36	36.4	1 52.47	+ 1 18.6	— 1	7	16.4	— 4.36	0.994 5744	0.973 2705	0.974 6603
16	319	44	6.3	1 52.49	1 18.8	1	7	33.8	4.36	0.994 5332	0.976 0669	0.977 4883
20	319	51	36.3	1 52.51	1 19.1	1	7	51.3	4.35	0.994 4920	0.978 9226	0.980 3676
24	319	59	6.4	1 52.53	1 19.3	1	8	8.7	4.35	0.994 4507	0.981 8219	0.983 2837
28	320	6	36.5	1 52.55	1 19.6	1	8	26.1	4.34	0.994 4093	0.984 7512	0.986 2225
Nov. 1	320	14	6.8	1 52.57	+ 1 19.8	— 1	8	43.5	— 4.34	0.994 3678	0.987 6960	0.989 1701
5	320	21	37.1	1 52.59	1 20.1	1	9	0.8	4.33	0.994 3262	0.990 6429	0.992 1125
9	320	29	7.5	1 52.61	1 20.3	1	9	18.2	4.33	0.994 2845	0.993 5773	0.995 0354
13	320	36	38.0	1 52.64	1 20.5	1	9	35.5	4.33	0.994 2428	0.996 4852	0.997 9249
17	320	44	8.6	1 52.66	1 20.8	1	9	52.8	4.32	0.994 2010	0.999 3530	1.000 7681
21	320	51	39.3	1 52.68	+ 1 21.0	— 1	10	10.1	— 4.32	0.994 1591	1.002 1688	1.003 5539
25	320	59	10.0	1 52.70	1 21.3	1	10	27.3	4.32	0.994 1171	1.004 9220	1.006 2719
29	321	6	40.9	1 52.72	1 21.5	1	10	44.6	4.31	0.994 0749	1.007 6023	1.008 9122
Dec. 3	321	14	11.8	1 52.74	1 21.7	1	11	1.9	4.31	0.994 0326	1.010 2002	1.011 4651
7	321	21	42.8	1 52.76	1 22.0	1	11	19.1	4.30	0.993 9903	1.012 7055	1.013 9202
11	321	29	13.9	1 52.78	+ 1 22.2	— 1	11	36.3	— 4.30	0.993 9480	1.015 1081	1.016 2682
15	321	36	45.1	1 52.81	1 22.5	1	11	53.5	4.29	0.993 9056	1.017 3996	1.018 5012
19	321	44	16.4	1 52.83	1 22.7	1	12	10.7	4.29	0.993 8632	1.019 5744	1.020 6124
23	321	51	47.7	1 52.85	1 22.9	1	12	27.8	4.28	0.993 8207	1.021 6205	1.022 5961
27	321	59	19.2	1 52.87	1 23.2	1	12	44.9	4.28	0.993 7781	1.023 5383	1.024 4464
31	322	6	50.7	1 52.89	+ 1 23.4	— 1	13	2.0	— 4.27	0.993 7354	1.025 3198	1.026 1578
35	322	14	22.3	1 52.91	+ 1 23.6	— 1	13	19.1	— 4.27	0.993 6926	1.026 9595	

URANUS.									
GREENWICH MEAN NOON.									
Date.	Heliocentric Longitude, Mean Equinox of Date.			Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.			Daily Motion.
	°	'	"			°	'	"	
Jan. 6	266	2	4.1	42.04	+ 4.0	0	10	0.4	- 0.55
14	266	7	40.5	42.04	4.0	0	10	4.8	0.55
22	266	13	16.7	42.03	4.0	0	10	9.3	0.55
30	266	18	52.9	42.02	4.0	0	10	13.7	0.55
Feb. 7	266	24	29.1	42.02	4.1	0	10	18.1	0.55
15	266	30	5.2	42.01	+ 4.1	0	10	22.5	- 0.55
23	266	35	41.2	42.00	4.1	0	10	27.0	0.55
Mar. 2	266	41	17.2	41.99	4.2	0	10	31.4	0.55
10	266	46	53.1	41.99	4.2	0	10	35.8	0.55
18	266	52	29.0	41.98	4.2	0	10	40.2	0.55
26	266	58	4.8	41.98	+ 4.2	0	10	44.6	- 0.55
Apr. 3	267	3	40.5	41.97	4.3	0	10	49.0	0.55
11	267	9	16.2	41.96	4.3	0	10	53.4	0.55
19	267	14	51.8	41.95	4.3	0	10	57.8	0.55
27	267	20	27.4	41.94	4.3	0	11	2.2	0.55
May 5	267	26	2.9	41.94	+ 4.4	0	11	6.6	- 0.55
13	267	31	38.4	41.93	4.4	0	11	11.0	0.55
21	267	37	13.8	41.92	4.4	0	11	15.4	0.55
29	267	42	49.1	41.92	4.4	0	11	19.8	0.55
June 6	267	48	24.4	41.91	4.5	0	11	24.2	0.55
14	267	53	59.6	41.90	+ 4.5	0	11	28.6	- 0.55
22	267	59	34.8	41.89	4.5	0	11	33.0	0.55
30	268	5	9.9	41.89	4.5	0	11	37.3	0.55
July 8	268	10	45.0	41.88	4.6	0	11	41.7	0.55
16	268	16	20.0	41.87	4.6	0	11	46.1	0.55
24	268	21	55.0	41.87	+ 4.6	0	11	50.5	- 0.55
Aug. 1	268	27	29.9	41.86	4.7	0	11	54.8	0.55
9	268	33	4.8	41.85	4.7	0	11	59.2	0.55
17	268	38	39.5	41.84	4.7	0	12	3.6	0.55
25	268	44	14.2	41.84	4.7	0	12	7.9	0.54
Sept. 2	268	49	48.9	41.83	+ 4.8	0	12	12.3	- 0.54
10	268	55	23.5	41.82	4.8	0	12	16.6	0.54
18	269	0	58.1	41.82	4.8	0	12	21.0	0.54
26	269	6	32.5	41.81	4.9	0	12	25.3	0.54
Oct. 4	269	12	7.0	41.80	4.9	0	12	29.7	0.54
12	269	17	41.4	41.80	+ 4.9	0	12	34.0	- 0.54
20	269	23	15.7	41.79	4.9	0	12	38.4	0.54
28	269	28	50.0	41.79	5.0	0	12	42.7	0.54
Nov. 5	269	34	24.2	41.78	5.0	0	12	47.0	0.54
13	269	39	58.4	41.77	5.0	0	12	51.4	0.54
21	269	45	32.5	41.76	+ 5.0	0	12	55.7	- 0.54
29	269	51	6.6	41.75	5.1	0	13	0.0	0.54
Dec. 7	269	56	40.6	41.75	5.1	0	13	4.3	0.54
15	270	2	14.5	41.74	5.1	0	13	8.7	0.54
23	270	7	48.4	41.73	5.1	0	13	13.0	0.54
31	270	13	22.2	41.73	+ 5.2	0	13	17.3	- 0.54
39	270	18	56.0	41.72	+ 5.2	0	13	21.6	- 0.54
	Logarithm of Radius Vector.			Logarithm of Distance from Earth—			At Date.	At Intermediate Date.	
	1.284	5955		1.305	1566		1.304	6715	
	1.284	6274		1.304	0941		1.303	4267	
	1.284	6593		1.302	6717		1.301	8325	
	1.284	6912		1.300	9127		1.299	9163	
	1.284	7230		1.298	8467		1.297	7079	
	1.284	7549		1.296	5044		1.295	2412	
	1.284	7867		1.293	9243		1.292	5591	
	1.284	8186		1.291	1523		1.289	7091	
	1.284	8504		1.288	2356		1.286	7382	
	1.284	8822		1.285	2240		1.283	7003	
	1.284	9140		1.282	1747		1.280	6543	
	1.284	9458		1.279	1464		1.277	6575	
	1.284	9776		1.276	1947		1.274	7660	
	1.285	0094		1.273	3789		1.272	0409	
	1.285	0412		1.270	7591		1.269	5395	
	1.285	0730		1.268	3883		1.267	3117	
	1.285	1047		1.266	3159		1.265	4066	
	1.285	1365		1.264	5894		1.263	8688	
	1.285	1682		1.263	2481		1.262	7304	
	1.285	2000		1.262	3188		1.262	0157	
	1.285	2317		1.261	8239		1.261	7445	
	1.285	2634		1.261	7771		1.261	9214	
	1.285	2951		1.262	1762		1.262	5404	
	1.285	3268		1.263	0122		1.263	5893	
	1.285	3585		1.264	2687		1.265	0462	
	1.285	3902		1.265	9169		1.266	8759	
	1.285	4219		1.267	9182		1.269	0386	
	1.285	4536		1.270	2316		1.271	4913	
	1.285	4852		1.272	8103		1.274	1817	
	1.285	5169		1.275	5984		1.277	0536	
	1.285	5486		1.278	5407		1.280	0530	
	1.285	5803		1.281	5830		1.283	1233	
	1.285	6119		1.284	6664		1.286	2051	
	1.285	6436		1.287	7331		1.289	2442	
	1.285	6752		1.290	7312		1.292	1886	
	1.285	7068		1.293	6096		1.294	9876	
	1.285	7385		1.296	3171		1.297	5929	
	1.285	7702		1.298	8104		1.299	9649	
	1.285	8018		1.301	0515		1.302	0659	
	1.285	8334		1.303	0033		1.303	8606	
	1.285	8650		1.304	6343		1.305	3223	
	1.285	8966		1.305	9222		1.306	4311	
	1.285	9282		1.306	8469		1.307	1676	
	1.285	9598		1.307	3921		1.307	5200	
	1.285	9914		1.307	5513		1.307	4857	
	1.286	0230		1.307	3235		1.307	0646	
	1.286	0545							



## NEPTUNE.

## GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.			Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.			Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
	°	'	"			°	'	"			At Date.	At Intermediate Date.
Jan. 6	94	36	13.5	21.89	-47.4	-1	2	56.1	+0.55	1.475 7232	1.461 4454	1.461 6731
14	94	39	8.6	21.89	47.4	1	2	51.7	0.55	1.475 7265	1.461 9728	1.462 3433
22	94	42	3.8	21.89	47.3	1	2	47.3	0.55	1.475 7298	1.462 7822	1.463 2870
30	94	44	58.9	21.89	47.3	1	2	42.9	0.55	1.475 7332	1.463 8543	1.464 4804
Feb. 7	94	47	54.0	21.89	47.3	1	2	38.5	0.55	1.475 7365	1.465 1621	1.465 8959
15	94	50	49.2	21.89	-47.3	-1	2	34.1	+0.55	1.475 7398	1.466 6775	1.467 5025
23	94	53	44.3	21.89	47.2	1	2	29.7	0.55	1.475 7431	1.468 3660	1.469 2630
Mar. 2	94	56	39.4	21.89	47.2	1	2	25.3	0.55	1.475 7465	1.470 1888	1.471 1387
10	94	59	34.6	21.89	47.2	1	2	20.9	0.55	1.475 7498	1.472 1079	1.473 0917
18	95	2	29.7	21.89	47.2	1	2	16.5	0.55	1.475 7531	1.474 0851	1.475 0830
26	95	5	24.9	21.89	-47.1	-1	2	12.1	+0.55	1.475 7564	1.476 0805	1.477 0725
Apr. 3	95	8	20.0	21.89	47.1	1	2	7.7	0.55	1.475 7598	1.478 0551	1.479 0240
11	95	11	15.2	21.90	47.1	1	2	3.3	0.55	1.475 7631	1.479 9750	1.480 9038
19	95	14	10.3	21.90	47.1	1	1	58.9	0.55	1.475 7664	1.481 8064	1.482 6786
27	95	17	5.5	21.90	47.0	1	1	54.4	0.55	1.475 7697	1.483 5169	1.484 3184
May 5	95	20	0.7	21.90	-47.0	-1	1	50.0	+0.55	1.475 7731	1.485 0801	1.485 7992
13	95	22	55.8	21.90	47.0	1	1	45.6	0.55	1.475 7764	1.486 4728	1.487 0980
21	95	25	51.0	21.90	46.9	1	1	41.2	0.55	1.475 7797	1.487 6727	1.488 1944
29	95	28	46.2	21.90	46.9	1	1	36.7	0.55	1.475 7830	1.488 6620	1.489 0739
June 6	95	31	41.3	21.90	46.9	1	1	32.3	0.55	1.475 7864	1.489 4288	1.489 7251
14	95	34	36.5	21.90	-46.9	-1	1	27.9	+0.55	1.475 7897	1.489 9616	1.490 1375
22	95	37	31.7	21.90	46.8	1	1	23.5	0.56	1.475 7931	1.490 2524	1.490 3062
30	95	40	26.9	21.90	46.8	1	1	19.0	0.56	1.475 7964	1.490 2989	1.490 2300
July 8	95	43	22.0	21.90	46.8	1	1	14.6	0.56	1.475 7998	1.490 1002	1.489 9095
16	95	46	17.2	21.90	46.7	1	1	10.1	0.56	1.475 8031	1.489 6588	1.489 3485
24	95	49	12.4	21.90	-46.7	-1	1	5.7	+0.56	1.475 8065	1.488 9803	1.488 5558
Aug. 1	95	52	7.6	21.90	46.7	1	1	1.2	0.56	1.475 8098	1.488 0764	1.487 5434
9	95	55	2.8	21.90	46.7	1	0	56.8	0.56	1.475 8132	1.486 9585	1.486 3238
17	95	57	58.0	21.90	46.6	1	0	52.3	0.56	1.475 8165	1.485 6420	1.484 9158
25	96	0	53.2	21.90	46.6	1	0	47.9	0.56	1.475 8199	1.484 1481	1.483 3420
Sept. 2	96	3	48.4	21.90	-46.6	-1	0	43.4	+0.56	1.475 8232	1.482 5003	1.481 6258
10	96	6	43.6	21.90	46.5	1	0	39.0	0.56	1.475 8266	1.480 7221	1.479 7933
18	96	9	38.8	21.90	46.5	1	0	34.5	0.56	1.475 8299	1.478 8437	1.477 8775
26	96	12	34.0	21.90	46.5	1	0	30.0	0.56	1.475 8332	1.476 8988	1.475 9117
Oct. 4	96	15	29.2	21.90	46.4	1	0	25.6	0.56	1.475 8366	1.474 9209	1.473 9305
12	96	18	24.4	21.90	-46.4	-1	0	21.1	+0.56	1.475 8399	1.472 9457	1.471 9715
20	96	21	19.6	21.90	46.4	1	0	16.6	0.56	1.475 8432	1.471 0128	1.470 0746
28	96	24	14.8	21.90	46.4	1	0	12.2	0.56	1.475 8465	1.469 1614	1.468 2777
Nov. 5	96	27	10.1	21.90	46.3	1	0	7.7	0.56	1.475 8499	1.467 4283	1.466 6182
13	96	30	5.3	21.90	46.3	1	0	3.2	0.56	1.475 8532	1.465 8521	1.465 1344
21	96	33	0.5	21.90	-46.3	-0	59	58.7	+0.56	1.475 8565	1.464 4690	1.463 8597
29	96	35	55.7	21.90	46.2	0	59	54.2	0.56	1.475 8599	1.463 3100	1.462 8230
Dec. 7	96	38	51.0	21.90	46.2	0	59	49.7	0.56	1.475 8632	1.462 4017	1.462 0490
15	96	41	46.2	21.90	46.2	0	59	45.2	0.56	1.475 8665	1.461 7675	1.461 5588
23	96	44	41.4	21.91	46.1	0	59	40.7	0.56	1.475 8698	1.461 4235	1.461 3625
31	96	47	36.7	21.91	-46.1	-0	59	36.2	+0.56	1.475 8732	1.461 3762	1.461 4652
39	96	50	31.9	21.91	-46.1	-0	59	31.7	+0.56	1.475 8765	1.461 6293	

## FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	Midnight.		Noon.	Midnight.		Noon.	Midnight.	
Jan. 1	+0.165 1943	+0.173 8057	- 45	-0.889 2038	-0.887 8167	+ 177	-0.385 6986	-0.385 0970	- 426
2	0.182 4036	0.190 9873	53	0.886 3611	0.884 8368	174	0.384 4656	0.383 8045	426
3	0.199 5561	0.208 1095	60	0.883 2441	0.881 5829	171	0.383 1136	0.382 3930	425
4	0.216 6469	0.225 1677	67	0.879 8535	0.878 0560	168	0.381 6428	0.380 8630	424
5	0.233 6713	0.242 1570	74	0.876 1906	0.874 2573	164	0.380 0536	0.379 2148	423
6	+0.250 6241	+0.259 0722	- 81	-0.872 2562	-0.870 1875	+ 160	-0.378 3466	-0.377 4490	- 422
7	0.267 5005	0.275 9084	88	0.868 0513	0.865 8475	156	0.376 5221	0.375 5659	421
8	0.284 2953	0.292 6605	95	0.863 5764	0.861 2381	151	0.374 5806	0.373 5660	420
9	0.301 0034	0.309 3233	102	0.858 8328	0.856 3606	146	0.372 5224	0.371 4498	419
10	0.317 6196	0.325 8915	109	0.853 8217	0.851 2161	141	0.370 3482	0.369 2178	418
11	+0.334 1383	+0.342 3595	- 115	-0.848 5441	-0.845 8059	+ 136	-0.368 0585	-0.366 8706	- 417
12	0.350 5544	0.358 7222	121	0.843 0016	0.840 1314	130	0.365 6540	0.364 4089	416
13	0.366 8624	0.374 9742	127	0.837 1956	0.834 1943	124	0.363 1353	0.361 8334	414
14	0.383 0570	0.391 1100	133	0.831 1277	0.827 9962	118	0.360 5033	0.359 1450	413
15	0.399 1327	0.407 1243	139	0.824 8001	0.821 5394	111	0.357 7586	0.356 3443	411
16	+0.415 0843	+0.423 0120	- 145	-0.818 2145	-0.814 8257	+ 105	-0.354 9022	-0.353 4325	- 410
17	0.430 9068	0.438 7679	150	0.811 3732	0.807 8573	98	0.351 9351	0.350 4102	408
18	0.446 5946	0.454 3864	155	0.804 2783	0.800 6366	91	0.348 8580	0.347 2786	407
19	0.462 1426	0.469 8628	160	0.796 9325	0.793 1662	83	0.345 6722	0.344 0389	405
20	0.477 5462	0.485 1922	165	0.789 3381	0.785 4486	76	0.342 3788	0.340 6920	403
21	+0.492 8002	+0.500 3696	- 169	-0.781 4980	-0.777 4866	+ 68	-0.338 9787	-0.337 2392	- 401
22	0.507 8997	0.515 3900	173	0.773 4148	0.769 2828	60	0.335 4734	0.333 6815	400
23	0.522 8400	0.530 2491	177	0.765 0912	0.760 8402	52	0.331 8637	0.330 0202	398
24	0.537 6167	0.544 9422	181	0.756 5304	0.752 1620	44	0.328 1512	0.326 2567	396
25	0.552 2250	0.559 4646	184	0.747 7355	0.743 2511	35	0.324 3370	0.322 3922	394
26	+0.566 6606	+0.573 8124	- 187	-0.738 7093	-0.734 1106	+ 27	-0.320 4225	-0.318 4280	- 392
27	0.580 9195	0.587 9813	190	0.729 4552	0.724 7436	18	0.316 4089	0.314 3655	390
28	0.594 9973	0.601 9671	193	0.719 9763	0.715 1537	+ 9	0.312 2978	0.310 2060	388
29	0.608 8902	0.615 7661	195	0.710 2761	0.705 3439	0	0.308 0904	0.305 9511	386
30	0.622 5944	0.629 3746	197	0.700 3575	0.695 3174	- 9	0.303 7882	0.301 6020	384
31	+0.636 1062	+0.642 7887	- 199	-0.690 2239	-0.685 0774	- 18	-0.299 3926	-0.297 1601	- 382
Feb. 1	0.649 4218	0.656 0049	201	0.679 8783	0.674 6270	27	0.294 9048	0.292 6268	380
2	0.662 5377	0.669 0197	203	0.669 3238	0.663 9692	37	0.290 3263	0.288 0035	377
3	0.675 4504	0.681 8293	204	0.658 5635	0.653 1071	46	0.285 6584	0.283 2913	375
4	0.688 1560	0.694 4300	205	0.647 6003	0.642 0435	56	0.280 9024	0.278 4918	372
5	+0.700 6508	+0.706 8180	- 206	-0.636 4372	-0.630 7817	- 66	-0.276 0598	-0.273 6063	- 370
6	0.712 9311	0.718 9896	206	0.625 0774	0.619 3247	76	0.271 1317	0.268 6361	367
7	0.724 9931	0.730 9411	206	0.613 5241	0.607 6760	85	0.266 1198	0.263 5829	365
8	0.736 8330	0.742 6684	206	0.601 7807	0.595 8387	95	0.261 0255	0.258 4480	362
9	0.748 4467	0.754 1676	206	0.589 8505	0.583 8166	105	0.255 8505	0.253 2332	359
10	+0.759 8305	+0.765 4351	- 205	-0.577 7374	-0.571 6134	- 115	-0.250 5962	-0.247 9399	- 356
11	0.770 9809	0.776 4674	204	0.565 4450	0.559 2327	125	0.245 2643	0.242 5697	353
12	0.781 8941	0.787 2607	203	0.552 9771	0.546 6786	135	0.239 8563	0.237 1244	350
13	0.792 5666	0.797 8115	201	0.540 3378	0.533 9551	145	0.234 3741	0.231 6057	347
14	0.802 9949	0.808 1164	199	0.527 5312	0.521 0664	155	0.228 8195	0.226 0156	344
15	+0.813 1757	+0.818 1723	- 197	-0.514 5614	-0.508 0165	- 165	-0.223 1943	-0.220 3557	- 341
16	+0.823 1059	+0.827 9761	- 195	-0.501 4324	-0.494 8097	- 175	-0.217 5001	-0.214 6278	- 338

## FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. o.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. o.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. o.
	Noon.	Midnight.		Noon.	Midnight.		Noon.	Midnight.	
Feb. 16	+0.823 1059	+0.827 9761	- 195	-0.501 4324	-0.494 8097	- 175	-0.217 5001	-0.214 6278	- 338
17	0.832 7825	0.837 5247	193	0.488 1490	0.481 4507	185	0.211 7390	0.208 8339	335
18	0.842 2023	0.846 8150	190	0.474 7153	0.467 9435	194	0.205 9128	0.202 9758	332
19	0.851 3625	0.855 8444	187	0.461 1359	0.454 2930	204	0.200 0233	0.197 0555	329
20	0.860 2605	0.864 6104	184	0.447 4154	0.440 5037	213	0.194 0727	0.191 0751	326
21	+0.868 8938	+0.873 1104	- 181	-0.433 5584	-0.426 5802	- 223	-0.188 0628	-0.185 0362	- 323
22	0.877 2600	0.881 3422	177	0.419 5695	0.412 5270	232	0.181 9955	0.178 9410	319
23	0.885 3568	0.889 3036	173	0.405 4533	0.398 3490	242	0.175 8730	0.172 7916	316
24	0.893 1823	0.896 9927	169	0.391 2146	0.384 0507	251	0.169 6972	0.166 5899	312
25	0.900 7346	0.904 4077	165	0.376 8579	0.369 6368	261	0.163 4700	0.160 3378	308
26	+0.908 0117	+0.911 5466	- 160	-0.362 3879	-0.355 1118	- 270	-0.157 1935	-0.154 0374	- 304
27	0.915 0121	0.918 4082	155	0.347 8091	0.340 4804	279	0.150 8697	0.147 6907	300
28	0.921 7347	0.924 9912	150	0.333 1261	0.325 7468	288	0.144 5005	0.141 2994	296
29	0.928 1777	0.931 2938	145	0.318 3431	0.310 9154	297	0.138 0877	0.134 8656	292
Mar. 1	0.934 3395	0.937 3146	140	0.303 4644	0.295 9906	306	0.131 6334	0.128 3912	288
2	+0.940 2189	+0.943 0524	- 134	-0.288 4946	-0.280 9767	- 315	-0.125 1393	-0.121 8780	- 284
3	0.945 8148	0.948 5059	128	0.273 4375	0.265 8775	324	0.118 6074	0.115 3278	280
4	0.951 1255	0.953 6735	122	0.258 2973	0.250 6974	333	0.112 0395	0.108 7427	276
5	0.956 1496	0.958 5536	116	0.243 0784	0.235 4407	341	0.105 4375	0.102 1242	272
6	0.960 8854	0.963 1448	110	0.227 7849	0.220 1115	349	0.098 8032	0.095 4746	268
7	+0.965 3316	+0.967 4457	- 103	-0.212 4212	-0.204 7146	- 357	-0.092 1387	-0.088 7957	- 263
8	0.969 4868	0.971 4548	97	0.196 9921	0.189 2544	365	0.085 4459	0.082 0895	259
9	0.973 3495	0.975 1707	90	0.181 5020	0.173 7355	373	0.078 7267	0.075 3579	254
10	0.976 9183	0.978 5922	83	0.165 9556	0.158 1628	381	0.071 9832	0.068 6031	250
11	0.980 1922	0.981 7182	76	0.150 3577	0.142 5409	389	0.065 2177	0.061 8272	245
12	+0.983 1701	+0.984 5477	- 69	-0.134 7131	-0.126 8748	- 397	-0.058 4319	-0.055 0322	- 241
13	0.985 8511	0.987 0800	61	0.119 0267	0.111 1694	404	0.051 6282	0.048 2203	236
14	0.988 2345	0.989 3144	54	0.103 3034	0.095 4295	411	0.044 8086	0.041 3935	231
15	0.990 3196	0.991 2501	46	0.087 5482	0.079 6601	418	0.037 9752	0.034 5540	226
16	0.992 1057	0.992 8864	38	0.071 7660	0.063 8665	425	0.031 1302	0.027 7040	221
17	+0.993 5923	+0.994 2233	- 30	-0.055 9621	-0.048 0535	- 432	-0.024 2758	-0.020 8457	- 216
18	0.994 7795	0.995 2607	22	0.040 1413	0.032 2261	439	0.017 4141	0.013 9812	211
19	0.995 6670	0.995 9983	13	0.024 3087	0.016 3897	446	0.010 5472	0.007 1125	206
20	0.996 2548	0.996 4365	- 5	-0.008 4696	-0.000 5491	453	-0.003 6774	-0.000 2421	201
21	0.996 5434	0.996 5755	+ 4	+0.007 3712	+0.015 2906	459	+0.003 1932	+0.006 6282	196
22	+0.996 5330	+0.996 4158	+ 13	+0.023 2086	+0.031 1245	- 466	+0.010 0625	+0.013 4960	- 191
23	0.996 2241	0.995 9579	22	0.039 0378	0.046 9477	472	0.016 9284	0.020 3594	186
24	0.995 6173	0.995 2026	31	0.054 8537	0.062 7552	478	0.023 7887	0.027 2161	181
25	0.994 7137	0.994 1508	40	0.070 6516	0.078 5424	484	0.030 6413	0.034 0641	175
26	0.993 5140	0.992 8035	49	0.086 4270	0.094 3047	490	0.037 4843	0.040 9015	170
27	+0.992 0194	+0.991 1618	+ 58	+0.102 1750	+0.110 0374	- 495	+0.044 3155	+0.047 7262	- 164
28	0.990 2308	0.989 2266	67	0.117 8913	0.125 7362	501	0.051 1333	0.054 5364	159
29	0.988 1493	0.986 9992	77	0.133 5716	0.141 3969	506	0.057 9354	0.061 3301	153
30	0.985 7762	0.984 4805	87	0.149 2117	0.157 0154	511	0.064 7202	0.068 1055	148
31	0.983 1124	0.981 6719	97	0.164 8074	0.172 5873	516	0.071 4858	0.074 8608	142
Apr. 1	+0.980 1592	+0.978 5742	+ 107	+0.180 3545	+0.188 1085	- 521	+0.078 2302	+0.081 5939	- 136
2	+0.976 9172	+0.975 1882	+ 117	+0.195 8488	+0.203 5750	- 526	+0.084 9516	+0.088 3032	- 130

## FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. o.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. o.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. o.
	Noon.	Midnight.		Noon.	Midnight.		Noon.	Midnight.	
Apr. 1	+0.980 1592	+0.978 5742	+ 107	+0.180 3545	+0.188 1085	- 521	+0.078 2302	+0.081 5939	- 136
2	0.976 9172	0.975 1882	117	0.195 8488	0.203 5750	526	0.084 9516	0.088 3032	130
3	0.973 3873	0.971 5148	127	0.211 2864	0.218 9824	531	0.091 6483	0.094 9868	124
4	0.969 5707	0.967 5553	137	0.226 6626	0.234 3264	535	0.098 3183	0.101 6427	118
5	0.965 4685	0.963 3105	147	0.241 9734	0.249 6029	540	0.104 9597	0.108 2691	112
6	+0.961 0814	+0.958 7815	+ 158	+0.257 2144	+0.264 8072	- 544	+0.111 5707	+0.114 8641	- 106
7	0.956 4109	0.953 9697	168	0.272 3809	0.279 9349	548	0.118 1492	0.121 4257	100
8	0.951 4582	0.948 8765	179	0.287 4686	0.294 9815	552	0.124 6934	0.127 9520	94
9	0.946 2247	0.943 5032	190	0.302 4730	0.309 9425	556	0.131 2013	0.134 4410	88
10	0.940 7120	0.937 8514	201	0.317 3895	0.324 8134	560	0.137 6709	0.140 8908	81
11	+0.934 9216	+0.931 9229	+ 212	+0.332 2136	+0.339 5896	- 564	+0.144 1004	+0.147 2995	- 75
12	0.928 8556	0.925 7197	223	0.346 9408	0.354 2667	567	0.150 4878	0.153 6652	69
13	0.922 5156	0.919 2435	234	0.361 5667	0.368 8402	570	0.156 8313	0.159 9859	63
14	0.915 9037	0.912 4964	245	0.376 0867	0.383 3056	573	0.163 1287	0.166 2596	56
15	0.909 0219	0.905 4807	256	0.390 4964	0.397 6584	576	0.169 3783	0.172 4846	50
16	+0.901 8729	+0.898 1988	+ 268	+0.404 7912	+0.411 8943	- 578	+0.175 5783	+0.178 6590	- 43
17	0.894 4588	0.890 6531	279	0.418 9670	0.426 0088	581	0.181 7266	0.184 7809	36
18	0.886 7821	0.882 8462	291	0.433 0192	0.439 9977	583	0.187 8215	0.190 8483	29
19	0.878 8457	0.874 7811	302	0.446 9438	0.453 8568	585	0.193 8610	0.196 8595	23
20	0.870 6526	0.866 4607	314	0.460 7364	0.467 5820	587	0.199 8436	0.202 8130	16
21	+0.862 2057	+0.857 8880	+ 326	+0.474 3931	+0.481 1694	- 589	+0.205 7674	+0.208 7067	- 9
22	0.853 5080	0.849 0661	338	0.487 9102	0.494 6151	590	0.211 6307	0.214 5392	- 2
23	0.844 5627	0.839 9981	350	0.501 2837	0.507 9155	591	0.217 4319	0.220 3087	+ 4
24	0.835 3727	0.830 6871	362	0.514 5101	0.521 0670	592	0.223 1695	0.226 0140	11
25	0.825 9415	0.821 1364	374	0.527 5859	0.534 0664	593	0.228 8420	0.231 6533	18
26	+0.816 2721	+0.811 3490	+ 386	+0.540 5081	+0.546 9104	- 594	+0.234 4477	+0.237 2251	+ 25
27	0.806 3676	0.801 3283	398	0.553 2731	0.559 5957	594	0.239 9853	0.242 7281	32
28	0.796 2315	0.791 0774	411	0.565 8779	0.572 1192	595	0.245 4534	0.248 1609	39
29	0.785 8664	0.780 5989	423	0.578 3193	0.584 4778	595	0.250 8505	0.253 5221	46
30	0.775 2752	0.769 8958	436	0.590 5943	0.596 6684	595	0.256 1754	0.258 8103	53
May 1	+0.764 4610	+0.758 9712	+ 448	+0.602 6996	+0.608 6877	- 594	+0.261 4265	+0.264 0240	+ 60
2	0.753 4267	0.747 8280	461	0.614 6323	0.620 5329	594	0.266 6026	0.269 1621	67
3	0.742 1755	0.736 4693	473	0.626 3891	0.632 2005	593	0.271 7023	0.274 2230	74
4	0.730 7100	0.724 8980	486	0.637 9666	0.643 6872	592	0.276 7240	0.279 2052	82
5	0.719 0336	0.713 1172	498	0.649 3617	0.654 9898	591	0.281 6664	0.284 1075	89
6	+0.707 1493	+0.701 1304	+ 511	+0.660 5710	+0.666 1049	- 589	+0.286 5282	+0.288 9284	+ 96
7	0.695 0609	0.688 9410	524	0.671 5912	0.677 0294	587	0.291 3078	0.293 6664	103
8	0.682 7713	0.676 5523	537	0.682 4192	0.687 7601	585	0.296 0039	0.298 3202	111
9	0.670 2843	0.663 9677	550	0.693 0518	0.698 2939	583	0.300 6152	0.302 8887	118
10	0.657 6031	0.651 1910	563	0.703 4859	0.708 6275	581	0.305 1404	0.307 3702	126
11	+0.644 7319	+0.638 2261	+ 576	+0.713 7182	+0.718 7578	- 578	+0.309 5779	+0.311 7635	+ 133
12	0.631 6741	0.625 0764	589	0.723 7457	0.728 6816	575	0.313 9267	0.316 0673	141
13	0.618 4336	0.611 7462	602	0.733 5652	0.738 3961	572	0.318 1853	0.320 2805	148
14	0.605 0146	0.598 2394	615	0.743 1739	0.747 8982	568	0.322 3526	0.324 4016	156
15	0.591 4211	0.584 5603	628	0.752 5687	0.757 1851	564	0.326 4272	0.328 4294	163
16	+0.577 6575	+0.570 7132	+ 641	+0.761 7469	+0.766 2539	- 560	+0.330 4080	+0.332 3628	+ 171
17	+0.563 7281	+0.556 7025	+ 654	+0.770 7058	+0.775 1022	- 555	+0.334 2938	+0.336 2007	+ 178

## FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X		Reduc. to Mean Eq'x of Jan. o.	Y		Reduc. to Mean Eq'x of Jan. o.	Z		Reduc. to Mean Eq'x of Jan. o.
	True Equinox.			True Equinox.			True Equinox.		
	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.
May 17	+0.563 7281	+0.556 7025	+ 654	+0.770 7058	+0.775 1022	- 555	+0.334 2938	+0.336 2007	+ 178
18	0.549 6372	0.542 5328	667	0.779 4428	0.783 7273	550	0.338 0835	0.339 9420	186
19	0.535 3897	0.528 2086	680	0.787 9555	0.792 1271	545	0.341 7760	0.343 5856	193
20	0.520 9900	0.513 7344	693	0.796 2419	0.800 2995	540	0.345 3706	0.347 1309	201
21	0.506 4425	0.499 1149	706	0.804 2997	0.808 2422	534	0.348 8662	0.350 5766	208
22	+0.491 7520	+0.484 3545	+ 719	+0.812 1269	+0.815 9536	- 528	+0.352 2619	+0.353 9220	+ 216
23	0.476 9229	0.469 4578	732	0.819 7221	0.823 4320	522	0.355 5569	0.357 1665	223
24	0.461 9596	0.454 4290	745	0.827 0832	0.830 6757	516	0.358 7506	0.360 3092	231
25	0.446 8666	0.439 2728	758	0.834 2091	0.837 6833	509	0.361 8421	0.363 3494	238
26	0.431 6481	0.423 9932	771	0.841 0980	0.844 4531	502	0.364 8309	0.366 2865	246
27	+0.416 3084	+0.408 5944	+ 784	+0.847 7483	+0.850 9836	- 495	+0.367 7160	+0.369 1195	+ 253
28	0.400 8516	0.393 0806	796	0.854 1587	0.857 2735	487	0.370 4968	0.371 8481	261
29	0.385 2819	0.377 4560	809	0.860 3278	0.863 3214	479	0.373 1731	0.374 4716	268
30	0.369 6034	0.361 7246	821	0.866 2541	0.869 1258	471	0.375 7437	0.376 9893	276
31	0.353 8202	0.345 8906	834	0.871 9362	0.874 6850	462	0.378 2082	0.379 4004	283
June 1	+0.337 9363	+0.329 9581	+ 846	+0.877 3722	+0.879 9976	- 453	+0.380 5659	+0.381 7045	+ 291
2	0.321 9563	0.313 9315	858	0.882 5609	0.885 0620	444	0.382 8162	0.383 9008	298
3	0.305 8842	0.297 8149	870	0.887 5007	0.889 8768	434	0.384 9584	0.385 9888	306
4	0.288 7243	0.281 6129	882	0.892 1901	0.894 4404	424	0.386 9919	0.387 9677	314
5	0.273 4813	0.265 3300	893	0.896 6275	0.898 7513	413	0.388 9160	0.389 8369	322
6	+0.257 1595	+0.248 9705	+ 905	+0.900 8117	+0.902 8084	- 402	+0.390 7302	+0.391 5959	+ 330
7	0.240 7634	0.232 5390	916	0.904 7412	0.906 6101	391	0.392 4340	0.393 2443	337
8	0.224 2977	0.216 0403	927	0.908 4150	0.910 1555	379	0.394 0268	0.394 7814	345
9	0.207 7672	0.199 4790	938	0.911 8315	0.913 4429	367	0.395 5081	0.396 2068	352
10	0.191 1764	0.182 8600	949	0.914 9896	0.916 4715	355	0.396 8775	0.397 5200	360
11	+0.174 5303	+0.166 1881	+ 959	+0.917 8883	+0.919 2400	- 342	+0.398 1344	+0.398 7205	+ 367
12	0.157 8339	0.149 4683	970	0.920 5264	0.921 7474	329	0.399 2783	0.399 8079	374
13	0.141 0921	0.132 7059	980	0.922 9030	0.923 9932	316	0.400 3091	0.400 7820	381
14	0.124 3102	0.115 9057	990	0.925 0177	0.925 9765	302	0.401 2264	0.401 6423	389
15	0.107 4931	0.099 0731	1000	0.926 8695	0.927 6967	288	0.402 0298	0.402 3887	396
16	+0.090 6464	+0.082 2134	+ 1010	+0.928 4581	+0.929 1536	- 274	+0.402 7192	+0.403 0212	+ 403
17	0.073 7748	0.065 3314	1019	0.929 7833	0.930 3472	259	0.403 2946	0.403 5395	410
18	0.056 8838	0.048 4325	1028	0.930 8452	0.931 2773	244	0.403 7558	0.403 9436	417
19	0.039 9782	0.031 5215	1037	0.931 6436	0.931 9442	229	0.404 1028	0.404 2335	424
20	0.023 0631	+0.014 6035	1045	0.932 1790	0.932 3481	213	0.404 3358	0.404 4095	431
21	+0.006 1433	-0.002 3170	+ 1053	+0.932 4515	+0.932 4892	- 197	+0.404 4547	+0.404 4714	+ 438
22	-0.010 7768	0.019 2354	1061	0.932 4614	0.932 3682	181	0.404 4597	0.404 4196	445
23	0.027 6922	0.036 1468	1069	0.932 2095	0.931 9853	164	0.404 3510	0.404 2540	452
24	0.044 5985	0.053 0467	1076	0.931 6957	0.931 3407	147	0.404 1286	0.403 9749	459
25	0.061 4910	0.069 9308	1083	0.930 9205	0.930 4352	130	0.403 7928	0.403 5823	466
26	-0.078 3656	-0.086 7948	+ 1090	+0.929 8848	+0.929 2693	- 113	+0.403 3436	+0.403 0767	+ 473
27	0.095 2178	0.103 6341	1096	0.928 5888	0.927 8432	95	0.402 7815	0.402 4581	479
28	0.112 0432	0.120 4445	1102	0.927 0326	0.926 1572	77	0.402 1064	0.401 7266	486
29	0.128 8374	0.137 2214	1108	0.925 2169	0.924 2117	59	0.401 3186	0.400 8824	492
30	0.145 5960	0.153 9606	1113	0.923 1418	0.922 0073	41	0.400 4181	0.399 9258	499
July 1	-0.162 3146	-0.170 6574	+ 1118	+0.920 8081	+0.919 5443	- 22	+0.399 4054	+0.398 8570	+ 505
2	-0.178 9886	-0.187 3075	+ 1123	+0.918 2159	+0.916 8230	- 3	+0.398 2805	+0.397 6760	+ 512

## FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. o.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. o.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. o.
	Noon.	Midnight.		Noon.	Midnight.		Noon.	Midnight.	
July 1	-0.162 3146	-0.170 6574	+ 1118	+0.920 8081	+0.919 5443	- 22	+0.399 4054	+0.398 8570	+ 505
2	0.178 9886	0.187 3075	1123	0.918 2159	0.916 8230	- 3	0.398 2805	0.397 6760	512
3	0.195 6135	0.203 9061	1127	0.915 3656	0.913 8441	+ 16	0.397 0436	0.396 3833	518
4	0.212 1847	0.220 4488	1131	0.912 2583	0.910 6083	35	0.395 6952	0.394 9792	525
5	0.228 6977	0.236 9309	1134	0.908 8942	0.907 1161	55	0.394 2354	0.393 4638	531
6	-0.245 1478	-0.253 3478	+ 1137	+0.905 2740	+0.903 3680	+ 75	+0.392 6646	+0.391 8377	+ 537
7	0.261 5304	0.269 6948	1140	0.901 3983	0.899 3650	95	0.390 9831	0.390 1009	543
8	0.277 8406	0.285 9670	1142	0.897 2682	0.895 1079	115	0.389 1912	0.388 2540	549
9	0.294 0736	0.302 1597	1144	0.892 8843	0.890 5974	136	0.387 2894	0.386 2974	555
10	0.310 2248	0.318 2682	1145	0.888 2475	0.885 8347	156	0.385 2782	0.384 2317	561
11	-0.326 2892	-0.334 2873	+ 1146	+0.883 3592	+0.880 8210	+ 177	+0.383 1579	+0.382 0571	+ 567
12	0.342 2619	0.350 2122	1146	0.878 2203	0.875 5574	198	0.380 9292	0.379 7744	573
13	0.358 1377	0.366 0378	1146	0.872 8325	0.870 0457	219	0.378 5927	0.377 3841	578
14	0.373 9119	0.381 7593	1146	0.867 1972	0.864 2873	240	0.376 1488	0.374 8869	584
15	0.389 5795	0.397 3719	1145	0.861 3163	0.858 2843	262	0.373 5986	0.372 2838	589
16	-0.405 1360	-0.412 8711	+ 1143	+0.855 1916	+0.852 0386	+ 283	+0.370 9428	+0.369 5755	+ 595
17	0.420 5766	0.428 2520	1141	0.848 8254	0.845 5523	305	0.368 1822	0.366 7629	600
18	0.435 8968	0.443 5105	1139	0.842 2195	0.838 8275	327	0.365 3178	0.363 8469	605
19	0.451 0926	0.458 6423	1136	0.835 3764	0.831 8666	349	0.362 3503	0.360 8283	610
20	0.466 1593	0.473 6431	1133	0.828 2983	0.824 6719	371	0.359 2809	0.357 7082	615
21	-0.481 0931	-0.488 5089	+ 1129	+0.820 9877	+0.817 2458	+ 393	+0.356 1104	+0.354 4875	+ 620
22	0.495 8900	0.503 2360	1125	0.813 4465	0.809 5902	415	0.352 8398	0.351 1672	625
23	0.510 5463	0.517 8205	1120	0.805 6772	0.801 7077	438	0.349 4700	0.347 7483	629
24	0.525 0581	0.532 2585	1115	0.797 6819	0.793 6002	461	0.346 0021	0.344 2316	634
25	0.539 4214	0.546 5462	1109	0.789 4629	0.785 2701	483	0.342 4370	0.340 6183	638
26	-0.553 6326	-0.560 6801	+ 1103	+0.781 0222	+0.776 7195	+ 505	+0.338 7757	+0.336 9092	+ 642
27	0.567 6881	0.574 6562	1096	0.772 3623	0.767 9508	527	0.335 0191	0.333 1054	646
28	0.581 5839	0.588 4708	1089	0.763 4852	0.758 9659	549	0.331 1682	0.329 2077	650
29	0.595 3164	0.602 1201	1081	0.754 3932	0.749 7673	571	0.327 2240	0.325 2172	654
30	0.608 8816	0.615 6004	1073	0.745 0886	0.740 3573	593	0.323 1874	0.321 1348	658
31	-0.622 2760	-0.628 9079	+ 1064	+0.735 5736	+0.730 7378	+ 615	+0.319 0596	+0.316 9618	+ 661
Aug. 1	0.635 4957	0.642 0389	1055	0.725 8503	0.720 9115	637	0.314 8415	0.312 6990	665
2	0.648 5370	0.654 9895	1045	0.715 9216	0.710 8808	659	0.310 5344	0.308 3477	668
3	0.661 3960	0.667 7560	1035	0.705 7896	0.700 6482	681	0.306 1392	0.303 9089	672
4	0.674 0689	0.680 3343	1025	0.695 4569	0.690 2161	702	0.301 6570	0.299 3837	675
5	-0.686 5518	-0.692 7209	+ 1014	+0.684 9261	+0.679 5873	+ 724	+0.297 0890	+0.294 7732	+ 678
6	0.698 8411	0.704 9119	1002	0.674 1999	0.668 7643	745	0.292 4363	0.290 0786	681
7	0.710 9328	0.716 9032	990	0.663 2809	0.657 7499	766	0.287 7002	0.285 3012	684
8	0.722 8228	0.728 6911	978	0.652 1719	0.646 5472	787	0.282 8818	0.280 4422	686
9	0.734 5075	0.740 2715	965	0.640 8761	0.635 1591	808	0.277 9825	0.275 5031	689
10	-0.745 9828	-0.751 6408	+ 951	+0.629 3966	+0.623 5890	+ 829	+0.273 0039	+0.270 4851	+ 691
11	0.757 2452	0.762 7953	937	0.617 7368	0.611 8403	850	0.267 9470	0.265 3897	693
12	0.768 2908	0.773 7312	923	0.605 8999	0.599 9163	870	0.262 8135	0.260 2184	695
13	0.779 1161	0.784 4451	908	0.593 8898	0.587 8211	890	0.257 6048	0.254 9729	697
14	0.789 7179	0.794 9338	893	0.581 7105	0.575 5584	910	0.252 3228	0.249 6547	698
15	-0.800 0927	-0.805 1941	+ 877	+0.569 3654	+0.563 1320	+ 930	+0.246 9688	+0.244 2654	+ 700
16	-0.810 2378	-0.815 2233	+ 861	+0.556 8586	+0.550 5458	+ 950	+0.241 5446	+0.238 8066	+ 701

## FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	Midnight		Noon.	Midnight.		Noon.	Midnight.	
Aug. 16	-0.810 2378	-0.815 2233	+ 861	+0.556 8586	+0.550 5458	+ 950	+0.241 5446	+0.238 8066	+ 701
17	0.820 1504	0.825 0186	845	0.544 1939	0.537 8034	969	0.236 0517	0.233 2800	703
18	0.829 8277	0.834 5772	828	0.531 3749	0.524 9088	988	0.230 4918	0.227 6872	704
19	0.839 2670	0.843 8968	811	0.518 4056	0.511 8657	1007	0.224 8665	0.222 0299	705
20	0.848 4662	0.852 9748	793	0.505 2897	0.498 6779	1026	0.219 1776	0.216 3097	706
21	-0.857 4225	-0.861 8089	+ 775	+0.492 0309	+0.485 3490	+ 1044	+0.213 4264	+0.210 5281	+ 707
22	0.866 1338	0.870 3968	756	0.478 6328	0.471 8827	1062	0.207 6148	0.204 6867	707
23	0.874 5977	0.878 7362	737	0.465 0991	0.458 2828	1080	0.201 7441	0.198 7871	708
24	0.882 8120	0.886 8248	718	0.451 4335	0.444 5522	1098	0.195 8160	0.192 8309	708
25	0.890 7742	0.894 6601	698	0.437 6393	0.430 6952	1115	0.189 8321	0.186 8197	708
26	-0.898 4821	-0.902 2400	+ 678	+0.423 7204	+0.416 7153	+ 1132	+0.183 7940	+0.180 7552	+ 708
27	0.905 9335	0.909 5624	658	0.409 6804	0.402 6161	1149	0.177 7034	0.174 6389	707
28	0.913 1263	0.916 6249	637	0.395 5229	0.388 4014	1165	0.171 5619	0.168 4726	707
29	0.920 0580	0.923 4253	616	0.381 2520	0.374 0750	1181	0.165 3711	0.162 2577	706
30	0.926 7265	0.929 9613	595	0.366 8710	0.359 6403	1197	0.159 1326	0.155 9960	705
31	-0.933 1296	-0.936 2310	+ 573	+0.352 3836	+0.345 1013	+ 1212	+0.152 8482	+0.149 6893	+ 704
Sept. 1	0.939 2652	0.942 2321	551	0.337 7940	0.330 4620	1227	0.146 5195	0.143 3391	703
2	0.945 1313	0.947 9624	529	0.323 1059	0.315 7261	1242	0.140 1482	0.136 9471	702
3	0.950 7253	0.953 4198	506	0.308 3231	0.300 8976	1256	0.133 7360	0.130 5151	700
4	0.956 0455	0.958 6022	483	0.293 4500	0.285 9807	1270	0.127 2847	0.124 0450	699
5	-0.961 0897	-0.963 5076	+ 459	+0.278 4904	+0.270 9796	+ 1283	+0.120 7962	+0.117 5386	+ 697
6	0.965 8557	0.968 1338	436	0.263 4488	0.255 8985	1296	0.114 2723	0.110 9976	695
7	0.970 3416	0.972 4788	412	0.248 3294	0.240 7420	1309	0.107 7147	0.104 4239	693
8	0.974 5452	0.976 5407	388	0.233 1368	0.225 5145	1321	0.101 1254	0.097 8196	691
9	0.978 4651	0.980 3181	363	0.217 8757	0.210 2210	1333	0.094 5066	0.091 1867	688
10	-0.982 0996	-0.983 8093	+ 338	+0.202 5509	+0.194 8661	+ 1344	+0.087 8601	+0.084 5271	+ 685
11	0.985 4471	0.987 0129	313	0.187 1672	0.179 4548	1355	0.081 1880	0.077 8430	682
12	0.988 5067	0.989 9282	288	0.171 7296	0.163 9921	1366	0.074 4924	0.071 1364	679
13	0.991 2774	0.992 5543	263	0.156 2428	0.148 4824	1376	0.067 7754	0.064 4095	676
14	0.993 7587	0.994 8904	237	0.140 7115	0.132 9308	1386	0.061 0391	0.057 6643	673
15	-0.995 9495	-0.996 9358	+ 211	+0.125 1408	+0.117 3420	+ 1395	+0.054 2854	+0.050 9026	+ 669
16	0.997 8495	0.998 6905	185	0.109 5351	0.101 7206	1404	0.047 5163	0.044 1267	665
17	0.999 4586	1.000 1537	159	0.093 8990	0.086 0710	1413	0.040 7340	0.037 3385	661
18	1.000 7759	1.001 3251	133	0.078 2371	0.070 3978	1421	0.033 9403	0.030 5398	657
19	1.001 8014	1.002 2047	106	0.062 5536	0.054 7052	1429	0.027 1371	0.023 7326	653
20	-1.002 5350	-1.002 7922	+ 80	+0.046 8532	+0.038 9980	+ 1436	+0.020 3264	+0.016 9189	+ 649
21	1.002 9763	1.003 0873	53	0.031 1401	0.023 2802	1443	0.013 5102	0.010 1005	644
22	1.003 1251	1.003 0898	+ 26	+0.015 4188	+0.007 5563	1449	+0.006 6902	+0.003 2795	639
23	1.002 9814	1.002 7997	- 1	-0.000 3066	-0.008 1694	1455	-0.000 1315	-0.003 5424	634
24	1.002 5448	1.002 2168	28	0.016 0315	0.023 8925	1461	0.006 9530	0.010 3631	629
25	-1.001 8155	-1.001 3410	- 56	-0.031 7517	-0.039 6087	+ 1466	-0.013 7724	-0.017 1808	+ 623
26	1.000 7933	1.000 1724	83	0.047 4628	0.055 3136	1471	0.020 5879	0.023 9935	617
27	0.999 4782	0.998 7108	111	0.063 1606	0.071 0030	1475	0.027 3974	0.030 7994	611
28	0.997 8701	0.996 9563	138	0.078 8405	0.086 6725	1479	0.034 1992	0.037 5965	605
29	0.995 9693	0.994 9091	166	0.094 4984	0.102 3176	1483	0.040 9912	0.044 3829	599
30	-0.993 7757	-0.992 5691	- 194	-0.110 1296	-0.117 9338	+ 1486	-0.047 7715	-0.051 1567	+ 593
Oct. 1	-0.991 2894	-0.989 9365	- 222	-0.125 7297	-0.133 5168	+ 1489	-0.054 5382	-0.057 9158	+ 586

## FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. o.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. o.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. o.
	Noon.	Midnight.		Noon.	Midnight.		Noon.	Midnight.	
Oct. 1	-0.991 2894	-0.989 9365	- 222	-0.125 7297	-0.133 5168	+ 1489	-0.054 5382	-0.057 9158	+ 586
2	0.988 5105	0.987 0114	250	0.141 2944	0.149 0620	1491	0.061 2893	0.064 6584	579
3	0.985 4393	0.983 7941	278	0.156 8190	0.164 5647	1493	0.068 0229	0.071 3824	572
4	0.982 0759	0.980 2848	306	0.172 2985	0.180 0199	1495	0.074 7368	0.078 0858	565
5	0.978 4208	0.976 4840	334	0.187 7284	0.195 4233	1496	0.081 4291	0.084 7665	558
6	-0.974 4744	-0.972 3922	- 362	-0.203 1040	-0.210 7698	+ 1497	-0.088 0976	-0.091 4223	+ 551
7	0.970 2374	0.968 0102	390	0.218 4200	0.226 0541	1497	0.094 7403	0.098 0513	543
8	0.965 7106	0.963 3389	418	0.233 6715	0.241 2715	1497	0.101 3550	0.104 6512	535
9	0.960 8952	0.958 3796	446	0.248 8534	0.256 4167	1496	0.107 9396	0.111 2199	527
10	0.955 7924	0.953 1336	474	0.263 9608	0.271 4849	1495	0.114 4919	0.117 7553	519
11	-0.950 4035	-0.947 6024	- 503	-0.278 9886	-0.286 4712	+ 1493	-0.121 0099	-0.124 2554	+ 511
12	0.944 7304	0.941 7878	531	0.293 9322	0.301 3708	1491	0.127 4915	0.130 7180	503
13	0.938 7749	0.935 6919	559	0.308 7865	0.316 1789	1488	0.133 9346	0.137 1411	494
14	0.932 5390	0.929 3165	587	0.323 5473	0.330 8911	1485	0.140 3372	0.143 5227	485
15	0.926 0246	0.922 6637	616	0.338 2098	0.345 5029	1481	0.146 6973	0.149 8608	476
16	-0.919 2339	-0.915 7355	- 644	-0.352 7698	-0.360 0100	+ 1477	-0.153 0131	-0.156 1538	+ 467
17	0.912 1687	0.908 5340	673	0.367 2230	0.374 4082	1473	0.159 2827	0.162 3996	457
18	0.904 8315	0.901 0616	701	0.381 5650	0.388 6931	1468	0.165 5042	0.168 5963	448
19	0.897 2244	0.893 3202	729	0.395 7918	0.402 8607	1463	0.171 6758	0.174 7423	438
20	0.889 3494	0.885 3123	757	0.409 8992	0.416 9069	1457	0.177 7956	0.180 8356	428
21	-0.881 2091	-0.877 0400	- 785	-0.423 8833	-0.430 8278	+ 1451	-0.183 8620	-0.186 8745	+ 418
22	0.872 8053	0.868 5054	813	0.437 7400	0.444 6192	1444	0.189 8730	0.192 8572	408
23	0.864 1406	0.859 7112	841	0.451 4651	0.458 2772	1437	0.195 8270	0.198 7820	397
24	0.855 2174	0.850 6595	869	0.465 0549	0.471 7979	1429	0.201 7221	0.204 6471	387
25	0.846 0378	0.841 3527	897	0.478 5055	0.485 1774	1421	0.207 5568	0.210 4510	376
26	-0.836 6044	-0.831 7933	- 925	-0.491 8129	-0.498 4116	+ 1413	-0.213 3293	-0.216 1916	+ 365
27	0.826 9196	0.821 9836	952	0.504 9731	0.511 4969	1404	0.219 0377	0.221 8675	354
28	0.816 9856	0.811 9260	980	0.517 9824	0.524 4292	1395	0.224 6806	0.227 4768	343
29	0.806 8050	0.801 6230	1007	0.530 8368	0.537 2046	1385	0.230 2560	0.233 0179	332
30	0.796 3804	0.791 0773	1034	0.543 5321	0.549 8189	1375	0.235 7624	0.238 4891	321
31	-0.785 7141	-0.780 2912	- 1061	-0.556 0645	-0.562 2683	+ 1364	-0.241 1979	-0.243 8885	+ 309
Nov. 1	0.774 8090	0.769 2678	1088	0.568 4298	0.574 5485	1353	0.246 5608	0.249 2146	297
2	0.763 6679	0.758 0098	1115	0.580 6240	0.586 6557	1341	0.251 8495	0.254 4654	285
3	0.752 2937	0.746 5201	1142	0.592 6431	0.598 5857	1329	0.257 0621	0.259 6393	273
4	0.740 6894	0.734 8020	1168	0.604 4828	0.610 3340	1317	0.262 1969	0.264 7345	261
5	-0.728 8583	-0.722 8589	- 1194	-0.616 1387	-0.621 8965	+ 1304	-0.267 2520	-0.269 7491	+ 249
6	0.716 8040	0.710 6941	1220	0.627 6069	0.633 2695	1290	0.272 2257	0.274 6816	230
7	0.704 5298	0.698 3115	1246	0.638 8837	0.644 4489	1276	0.277 1166	0.279 5304	224
8	0.692 0398	0.685 7153	1272	0.649 9647	0.655 4307	1262	0.281 9227	0.284 2935	211
9	0.679 3383	0.672 9093	1298	0.660 8464	0.666 2114	1247	0.286 6424	0.288 9694	198
10	-0.666 4289	-0.659 8976	- 1323	-0.671 5251	-0.676 7871	+ 1232	-0.291 2742	-0.293 5567	+ 185
11	0.653 3159	0.646 6845	1348	0.681 9971	0.687 1547	1216	0.295 8167	0.298 0539	172
12	0.640 0039	0.633 2746	1373	0.692 2594	0.697 3109	1200	0.300 2682	0.302 4594	159
13	0.626 4970	0.619 6717	1398	0.702 3087	0.707 2527	1183	0.304 6275	0.306 7721	146
14	0.612 7993	0.605 8803	1422	0.712 1423	0.716 9772	1166	0.308 8932	0.310 9906	132
15	-0.598 9153	-0.591 9048	- 1447	-0.721 7570	-0.726 4814	+ 1148	-0.313 0642	-0.315 1138	+ 119
16	-0.584 8492	-0.577 7491	- 1471	-0.731 1500	-0.735 7625	+ 1130	-0.317 1391	-0.319 1400	+ 105



## FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. o.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. o.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. o.
	Noon.	Midnight.		Noon.	Midnight.		Noon.	Midnight.	
Nov. 16	-0.584 8492	-0.577 7491	-1471	-0.731 1500	-0.735 7625	+ 1130	-0.317 1391	-0.319 1400	+ 105
17	0.570 6052	0.563 4180	1495	0.740 3186	0.744 8179	1111	0.321 1165	0.323 0684	92
18	0.556 1880	0.548 9156	1519	0.749 2601	0.753 6448	1092	0.324 9956	0.326 8977	78
19	0.541 6015	0.534 2462	1542	0.757 9717	0.762 2406	1073	0.328 7748	0.330 6267	65
20	0.526 8503	0.519 4142	1565	0.766 4511	0.770 6029	1053	0.332 4532	0.334 2543	51
21	-0.511 9386	-0.504 4239	-1588	-0.774 6957	-0.778 7293	+ 1032	-0.336 0297	-0.337 7794	+ 37
22	0.496 8708	0.489 2797	1610	0.782 7034	0.786 6176	1011	0.339 5033	0.341 2012	23
23	0.481 6511	0.473 9857	1632	0.790 4715	0.794 2650	990	0.342 8729	0.344 5184	+ 9
24	0.466 2839	0.458 5463	1654	0.797 9977	0.801 6694	968	0.346 1374	0.347 7300	- 5
25	0.450 7734	0.442 9658	1676	0.805 2799	0.808 8288	946	0.349 2959	0.350 8351	19
26	-0.435 1241	-0.427 2487	-1697	-0.812 3158	-0.815 7407	+ 923	-0.352 3474	-0.353 8327	- 33
27	0.419 3403	0.411 3992	1718	0.819 1030	0.822 4024	900	0.355 2909	0.356 7218	47
28	0.403 4262	0.395 4219	1738	0.825 6386	0.828 8115	876	0.358 1252	0.359 5012	62
29	0.387 3867	0.379 3212	1758	0.831 9208	0.834 9661	854	0.360 8495	0.362 1700	76
30	0.371 2261	0.363 1019	1778	0.837 9472	0.840 8638	829	0.363 4627	0.364 7274	91
Dec. 1	-0.354 9493	-0.346 7688	-1797	-0.843 7155	-0.846 5021	+ 804	-0.365 9640	-0.367 1723	-105
2	0.338 5610	0.330 3266	1816	0.849 2232	0.851 8787	776	0.368 3523	0.369 5038	120
3	0.322 0663	0.313 7807	1834	0.854 4683	0.856 9915	750	0.370 6267	0.371 7209	134
4	0.305 4705	0.297 1363	1852	0.859 4485	0.861 8386	723	0.372 7863	0.373 8229	149
5	0.288 7788	0.280 3986	1870	0.864 1618	0.866 4178	696	0.374 8304	0.375 8089	164
6	-0.271 9965	-0.263 5732	-1887	-0.868 6064	-0.870 7273	+ 668	-0.376 7581	-0.377 6780	-179
7	0.255 1294	0.246 6657	1903	0.872 7805	0.874 7658	640	0.378 5686	0.379 4297	193
8	0.238 1829	0.229 6816	1919	0.876 6829	0.878 5317	611	0.380 2613	0.381 0634	208
9	0.221 1626	0.212 6266	1935	0.880 3121	0.882 0239	582	0.381 8358	0.382 5785	223
10	0.204 0743	0.195 5064	1950	0.883 6669	0.885 2411	553	0.383 2913	0.383 9743	238
11	-0.186 9235	-0.178 3264	-1964	-0.886 7464	-0.888 1826	+ 523	-0.384 6275	-0.385 2508	-253
12	0.169 7157	0.161 0921	1978	0.889 5497	0.890 8476	493	0.385 8441	0.386 4074	268
13	0.152 4564	0.143 8093	1992	0.892 0763	0.893 2356	463	0.386 9406	0.387 4438	283
14	0.135 1513	0.126 4832	2005	0.894 3254	0.895 3458	432	0.387 9168	0.388 3597	298
15	0.117 8056	0.109 1193	2017	0.896 2966	0.897 1779	401	0.388 7724	0.389 1550	313
16	-0.100 4249	-0.091 7230	-2029	-0.897 9895	-0.898 7314	+ 369	-0.389 5074	-0.389 8294	-328
17	0.083 0143	0.074 2996	2040	0.899 4037	0.900 0063	337	0.390 1212	0.390 3828	343
18	0.065 5794	0.056 8544	2051	0.900 5391	0.901 0021	304	0.390 6147	0.390 8151	357
19	0.048 1253	0.039 3928	2061	0.901 3953	0.901 7188	271	0.390 9859	0.391 1263	372
20	0.030 6574	0.021 9198	2070	0.901 9725	0.902 1564	238	0.391 2364	0.391 3162	386
21	-0.013 1807	-0.004 4407	-2079	-0.902 2705	-0.902 3149	+ 205	-0.391 3657	-0.391 3849	-401
22	+0.004 2996	+0.013 0395	2087	0.902 2895	0.902 1942	171	0.391 3738	0.391 3324	415
23	0.021 7785	0.030 5159	2094	0.902 0292	0.901 7945	137	0.391 2607	0.391 1588	430
24	0.039 2510	0.047 9832	2101	0.901 4901	0.901 1159	102	0.391 0266	0.390 8640	445
25	0.056 7119	0.065 4365	2107	0.900 6719	0.900 1582	67	0.390 6712	0.390 4480	460
26	+0.074 1564	+0.082 8708	-2113	-0.899 5747	-0.898 9214	+ 32	-0.390 1946	-0.389 9110	-474
27	0.091 5791	0.100 2806	2117	0.898 1984	0.897 4058	- 3	0.389 5971	0.389 2530	489
28	0.108 9748	0.117 6610	2121	0.896 5435	0.895 6115	39	0.388 8786	0.388 4740	503
29	0.126 3386	0.135 0067	2124	0.894 6098	0.893 5383	75	0.388 0392	0.387 5742	517
30	0.143 6647	0.152 3119	2127	0.892 3971	0.891 1864	111	0.387 0789	0.386 5535	531
31	+0.160 9477	+0.169 5712	-2129	-0.889 9061	-0.888 5564	- 147	-0.385 9979	-0.385 4123	-546
32	+0.178 1819	+0.186 7791	-2130	-0.887 1373	-0.885 6489	- 184	-0.384 7966	-0.384 1510	-560

## FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	JANUARY.		Day of Month.	FEBRUARY.		Day of Month.	MARCH.	
	True Longitude.	Latitude.		True Longitude.	Latitude.		True Longitude.	Latitude.
1.0	75 41 15.1	-4 49 37.5	1.0	128 30 41.3	-3 56 2.4	1.0	151 44 8.6	-2 17 49.6
1.5	82 58 48.8	4 57 35.1	1.5	136 9 57.1	3 27 32.2	1.5	159 20 28.5	1 38 51.2
2.0	90 21 49.7	5 0 41.8	2.0	143 48 40.9	2 55 18.1	2.0	166 55 21.7	0 58 13.6
2.5	97 49 17.5	4 58 44.2	2.5	151 25 31.7	2 20 1.1	2.5	174 27 36.8	-0 16 47.3
3.0	105 20 2.7	4 51 36.5	3.0	158 59 15.1	1 42 27.5	3.0	181 56 8.1	+0 24 37.3
3.5	112 52 49.3	-4 39 21.5	3.5	166 28 46.2	-1 3 25.0	3.5	189 19 58.3	+1 5 11.9
4.0	120 26 18.8	4 22 11.0	4.0	173 53 11.1	-0 23 41.5	4.0	196 38 19.9	1 44 12.7
4.5	127 59 13.7	4 0 25.2	4.5	181 11 47.9	+0 15 56.9	4.5	203 50 36.0	2 21 1.1
5.0	135 30 20.9	3 34 31.8	5.0	188 24 7.9	0 54 47.9	5.0	210 56 20.6	2 55 4.9
5.5	142 58 34.7	3 5 4.4	5.5	195 29 53.3	1 32 13.9	5.5	217 55 18.5	3 25 58.3
6.0	150 22 59.7	-2 32 41.4	6.0	202 28 57.6	+2 7 42.3	6.0	224 47 24.4	+3 53 21.9
6.5	157 42 51.3	1 58 3.2	6.5	209 21 23.9	2 40 45.8	6.5	231 32 41.7	4 17 1.9
7.0	164 57 36.6	1 21 51.5	7.0	216 7 22.5	3 11 2.4	7.0	238 11 22.0	4 36 49.8
7.5	172 6 54.3	0 44 46.8	7.5	222 47 10.2	3 38 14.8	7.5	244 43 42.8	4 52 41.4
8.0	179 10 33.8	-0 7 27.8	8.0	229 21 8.2	4 2 9.7	8.0	251 10 6.8	5 4 36.0
8.5	186 8 33.6	+0 29 29.4	8.5	235 49 41.1	+4 22 37.5	8.5	257 31 0.7	+5 12 35.7
9.0	193 0 59.7	1 5 32.0	9.0	242 13 15.3	4 39 31.9	9.0	263 46 53.9	5 16 44.7
9.5	199 48 4.0	1 40 10.7	9.5	248 32 18.1	4 52 49.2	9.5	269 58 17.5	5 17 8.9
10.0	206 30 3.1	2 12 59.8	10.0	254 47 17.1	5 2 27.8	10.0	276 5 43.7	5 13 55.6
10.5	213 7 16.1	2 43 36.8	10.5	260 58 39.2	5 8 28.0	10.5	282 9 44.6	5 7 13.0
11.0	219 40 3.5	+3 11 42.5	11.0	267 6 50.0	+5 10 51.8	11.0	288 10 52.4	+4 57 10.2
11.5	226 8 46.3	3 37 0.6	11.5	273 12 14.1	5 9 42.9	11.5	294 9 38.3	4 43 57.0
12.0	232 33 45.2	3 59 17.8	12.0	279 15 14.2	5 5 6.1	12.0	300 6 32.4	4 27 43.8
12.5	238 55 19.6	4 18 23.3	12.5	285 16 11.4	4 57 7.8	12.5	306 2 3.0	4 8 42.0
13.0	245 13 47.1	4 34 8.5	13.0	291 15 24.7	4 45 55.6	13.0	311 56 37.1	3 47 3.6
13.5	251 29 23.4	+4 46 27.2	13.5	297 13 11.7	+4 31 38.3	13.5	317 50 39.9	+3 23 1.5
14.0	257 42 22.6	4 55 15.5	14.0	303 9 48.6	4 14 26.1	14.0	323 44 34.6	2 56 49.6
14.5	263 52 56.6	5 0 31.8	14.5	309 5 30.6	3 54 30.5	14.5	329 38 42.9	2 28 42.9
15.0	270 1 15.4	5 2 16.4	15.0	315 0 31.6	3 32 4.3	15.0	335 33 24.6	1 58 57.4
15.5	276 7 27.7	5 0 31.8	15.5	320 55 5.2	3 7 21.4	15.5	341 28 58.0	1 27 50.1
16.0	282 11 41.3	+4 55 22.3	16.0	326 49 25.1	+2 40 36.7	16.0	347 25 40.2	+0 55 39.1
16.5	288 14 3.7	4 46 54.2	16.5	332 43 45.2	2 12 6.4	16.5	353 23 46.8	+0 22 43.7
17.0	294 14 41.8	4 35 15.6	17.0	338 38 19.6	1 42 7.5	17.0	359 23 12.6	-0 10 36.1
17.5	300 13 43.9	4 20 36.2	17.5	344 33 23.5	1 10 57.7	17.5	5 25 11.6	0 43 59.4
18.0	306 11 18.7	4 3 7.1	18.0	350 29 13.3	0 38 55.6	18.0	11 28 57.2	1 17 4.4
18.5	312 7 36.6	+3 43 0.7	18.5	356 26 6.9	+0 6 20.3	18.5	17 35 2.6	-1 49 28.9
19.0	318 2 49.9	3 20 30.9	19.0	2 24 23.9	-0 26 28.6	19.0	23 43 41.0	2 20 50.7
19.5	323 57 13.2	2 55 52.2	19.5	8 24 25.7	0 59 11.2	19.5	29 55 5.5	2 50 47.1
20.0	329 51 3.7	2 29 19.5	20.0	14 26 35.4	1 31 27.1	20.0	36 9 29.8	3 18 55.7
20.5	335 44 41.2	2 1 8.9	20.5	20 31 18.0	2 2 55.6	20.5	42 27 7.5	3 44 54.2
21.0	341 38 28.4	+1 31 36.5	21.0	26 39 0.1	-2 33 15.7	21.0	48 48 12.6	-4 8 20.9
21.5	347 32 50.9	1 0 59.3	21.5	32 50 9.5	3 2 6.3	21.5	55 12 59.8	4 28 54.9
22.0	353 28 17.6	+0 29 34.5	22.0	39 5 15.3	3 29 5.6	22.0	61 41 43.4	4 46 16.2
22.5	359 25 19.5	-0 2 20.3	22.5	45 24 47.4	3 53 51.6	22.5	68 14 37.2	5 0 5.9
23.0	5 24 30.3	0 34 26.9	23.0	51 49 14.5	4 16 2.5	23.0	74 51 54.5	5 10 6.6
23.5	11 26 26.0	-1 6 26.8	23.5	58 19 3.9	-4 35 15.9	23.5	81 33 47.1	-5 16 2.7
24.0	17 31 44.1	1 38 0.3	24.0	64 54 40.8	4 51 9.7	24.0	88 20 24.7	5 17 40.8
24.5	23 41 3.1	2 8 47.1	24.5	71 36 27.3	5 3 22.3	24.5	95 11 54.1	5 14 50.5
25.0	29 55 1.6	2 38 25.8	25.0	78 24 40.4	5 11 33.0	25.0	102 8 18.6	5 7 24.4
25.5	36 14 17.8	3 6 34.0	25.5	85 19 30.8	5 15 22.9	25.5	109 9 36.9	4 55 19.3
26.0	42 39 28.0	-3 32 47.8	26.0	92 21 1.6	-5 14 35.7	26.0	116 15 42.1	-4 38 36.6
26.5	49 11 5.1	3 56 42.2	26.5	99 29 6.5	5 8 58.6	26.5	123 26 21.3	4 17 22.9
27.0	55 49 37.4	4 17 51.4	27.0	106 43 29.5	4 58 23.6	27.0	130 41 14.7	3 51 51.0
27.5	62 35 27.3	4 35 49.0	27.5	114 3 43.2	4 42 48.9	27.5	137 59 55.0	3 22 19.9
28.0	69 28 48.6	4 50 8.4	28.0	121 29 9.0	4 22 19.8	28.0	145 21 47.8	2 49 15.2
28.5	76 29 45.1	-5 0 24.2	28.5	128 58 57.4	-3 57 9.5	28.5	152 46 11.6	-2 13 9.0
29.0	83 38 9.2	5 6 12.8	29.0	136 32 9.1	3 27 39.6	29.0	160 12 18.5	1 34 39.4
29.5	90 53 40.6	5 7 14.2	29.5	144 7 37.1	2 54 20.4	29.5	167 39 15.5	0 54 29.0
30.0	98 15 44.8	5 3 13.7	30.0	151 44 8.6	2 17 49.6	30.0	175 6 5.9	-0 13 23.9
30.5	105 43 34.3	4 54 2.4	30.5	159 20 28.5	1 38 51.2	30.5	182 31 51.1	+0 27 48.0
31.0	113 16 8.9	-4 39 39.6	31.0	166 55 21.7	-0 58 13.6	31.0	189 55 32.5	+1 8 19.5
31.5	120 52 17.6	-4 20 13.8	31.5	174 27 36.8	-0 16 47.3	31.5	197 16 14.3	+1 47 25.1

## FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	APRIL.		Day of Month.	MAY.		Day of Month.	JUNE.	
	True Longitude.	Latitude.		True Longitude.	Latitude.		True Longitude.	Latitude.
1.0	204 33 4.5	+ 2 24 23.3	1.0	240 47 32.0	+ 4 38 4.2	1.0	288 2 44.2	+ 4 36 10.7
1.5	211 45 16.9	2 58 38.1	1.5	247 33 58.8	4 51 58.6	1.5	294 15 15.0	4 21 19.9
2.0	218 52 12.8	3 29 39.2	2.0	254 15 0.1	5 1 40.5	2.0	300 23 48.0	4 3 34.8
2.5	225 53 21.7	3 57 3.1	2.5	260 50 28.2	5 7 12.1	2.5	306 28 44.7	3 43 11.8
3.0	232 48 22.0	4 20 32.7	3.0	267 20 22.9	5 8 39.5	3.0	312 30 30.8	3 20 28.0
3.5	239 37 1.1	+ 4 39 57.2	3.5	273 44 50.9	+ 5 6 11.8	3.5	318 29 36.0	+ 2 55 39.9
4.0	246 19 15.0	4 55 11.4	4.0	280 4 5.6	5 0 0.6	4.0	324 26 33.2	2 29 4.0
4.5	252 55 7.8	5 6 14.6	4.5	286 18 26.4	4 50 18.7	4.5	330 21 58.5	2 0 57.0
5.0	259 24 51.1	5 13 10.1	5.0	292 28 17.4	4 37 20.4	5.0	336 16 29.9	1 31 35.2
5.5	265 48 42.6	5 16 4.2	5.5	298 34 7.3	4 21 20.3	5.5	342 10 47.1	1 1 14.9
6.0	272 7 5.8	+ 5 15 5.5	6.0	304 36 28.5	+ 4 2 33.4	6.0	348 5 30.8	+ 0 30 12.4
6.5	278 20 28.3	5 10 24.1	6.5	310 35 56.1	3 41 14.8	6.5	354 1 22.4	- 0 1 15.4
7.0	284 29 21.2	5 2 11.4	7.0	316 33 7.2	3 17 39.6	7.0	359 59 2.8	0 32 51.5
7.5	290 34 18.0	4 50 39.3	7.5	322 28 40.7	2 52 2.7	7.5	5 59 12.1	1 4 18.0
8.0	296 35 54.1	4 36 0.4	8.0	328 23 16.1	2 24 39.3	8.0	12 2 28.9	1 35 15.8
8.5	302 34 45.6	+ 4 18 27.4	8.5	334 17 32.7	+ 1 55 45.0	8.5	18 9 29.6	- 2 5 25.5
9.0	308 31 29.1	3 58 13.3	9.0	340 12 9.8	1 25 35.1	9.0	24 20 47.3	2 34 26.1
9.5	314 26 40.9	3 35 31.5	9.5	346 7 45.9	0 54 25.6	9.5	30 36 51.0	3 1 55.5
10.0	320 20 56.5	3 10 35.6	10.0	352 4 57.7	+ 0 22 33.4	10.0	36 58 4.9	3 27 30.6
10.5	326 14 50.2	2 43 39.8	10.5	358 4 19.9	- 0 9 43.4	10.5	43 24 47.2	3 50 47.7
11.0	332 8 54.7	+ 2 14 59.0	11.0	4 6 24.6	- 0 42 6.3	11.0	49 57 9.4	- 4 11 22.7
11.5	338 3 41.1	1 44 48.8	11.5	10 11 40.8	1 14 15.2	11.5	56 35 15.6	4 28 51.4
12.0	343 59 38.2	1 13 25.6	12.0	16 20 34.0	1 45 48.9	12.0	63 19 1.9	4 42 51.1
12.5	349 57 12.5	0 41 6.9	12.5	22 33 25.5	2 16 25.1	12.5	70 8 16.2	4 53 0.4
13.0	355 56 47.5	+ 0 8 11.5	13.0	28 50 31.8	2 45 40.2	13.0	77 2 38.3	4 59 1.2
13.5	1 58 44.4	- 0 25 0.7	13.5	35 12 4.3	- 3 13 10.1	13.5	84 1 40.4	- 5 0 38.6
14.0	8 3 21.6	0 58 8.7	14.0	41 38 9.4	3 38 30.2	14.0	91 4 48.3	4 57 43.0
14.5	14 10 54.2	1 30 50.5	14.5	48 8 47.7	4 1 15.9	14.5	98 11 22.0	4 50 9.9
15.0	20 21 34.6	2 2 43.1	15.0	54 43 54.7	4 21 3.4	15.0	105 20 38.4	4 38 1.0
15.5	26 35 32.5	2 33 22.9	15.5	61 23 20.5	4 37 30.4	15.5	112 31 52.5	4 21 24.2
16.0	32 52 54.4	- 3 2 25.9	16.0	68 6 50.6	- 4 50 16.4	16.0	119 44 19.4	- 4 0 33.7
16.5	39 13 44.8	3 29 28.2	16.5	74 54 5.9	4 59 4.1	16.5	126 57 16.2	3 35 49.8
17.0	45 38 5.5	3 54 6.1	17.0	81 44 45.3	5 3 39.4	17.0	134 10 3.7	3 7 37.6
17.5	52 5 56.3	4 15 56.9	17.5	88 38 23.9	5 3 52.5	17.5	141 22 7.3	2 36 26.5
18.0	58 37 15.6	+ 4 34 39.2	18.0	95 34 36.9	4 59 38.0	18.0	148 32 57.8	2 2 49.7
18.5	65 12 0.5	- 4 49 53.5	18.5	102 32 58.8	- 4 50 55.5	18.5	155 42 11.8	- 1 27 22.3
19.0	71 50 6.9	5 1 22.5	19.0	109 33 5.4	4 37 49.5	19.0	162 49 31.8	0 50 40.7
19.5	78 31 30.0	5 8 51.3	19.5	116 34 33.9	4 20 29.4	19.5	169 54 45.2	- 0 13 21.7
20.0	85 16 5.2	5 12 8.1	20.0	123 37 3.8	3 59 9.3	20.0	176 57 43.6	+ 0 23 58.6
20.5	92 3 47.6	5 11 4.6	20.5	130 40 17.8	3 34 8.0	20.5	183 58 22.3	1 0 44.6
21.0	98 54 32.0	- 5 5 35.7	21.0	137 44 1.0	- 3 5 47.9	21.0	190 56 38.8	+ 1 36 23.1
21.5	105 48 13.3	4 55 40.6	21.5	144 48 1.0	2 34 35.4	21.5	197 52 31.9	2 10 22.8
22.0	112 44 46.1	4 41 22.4	22.0	151 52 7.7	2 0 59.6	22.0	204 46 0.9	2 42 14.9
22.5	119 44 4.5	4 22 48.5	22.5	158 56 12.3	1 25 32.4	22.5	211 37 4.7	3 11 33.6
23.0	126 46 1.4	4 0 10.8	23.0	166 0 6.8	0 48 47.5	23.0	218 25 41.3	3 37 56.1
23.5	133 50 28.4	- 3 33 45.8	23.5	173 3 43.2	- 0 11 20.0	23.5	225 11 47.3	+ 4 1 3.0
24.0	140 57 14.9	3 3 54.5	24.0	180 6 52.2	+ 0 26 14.3	24.0	231 55 17.6	4 20 38.4
24.5	148 6 7.7	2 31 2.6	24.5	187 9 23.2	1 3 19.4	24.5	238 36 5.8	4 36 30.0
25.0	155 16 50.3	1 55 40.0	25.0	194 11 3.4	1 39 20.1	25.0	245 14 4.2	4 48 29.5
25.5	162 29 2.2	1 18 20.6	25.5	201 11 37.2	2 13 42.4	25.5	251 49 4.4	4 56 31.9
26.0	169 42 19.1	- 0 39 41.6	26.0	208 10 46.6	+ 2 45 54.6	26.0	258 20 57.8	+ 5 0 36.3
26.5	176 56 12.4	- 0 0 22.6	26.5	215 8 11.1	3 15 27.5	26.5	264 49 36.0	5 0 45.1
27.0	184 10 9.5	+ 0 38 55.2	27.0	222 3 28.3	3 41 55.7	27.0	271 14 52.0	4 57 3.9
27.5	191 23 34.3	1 17 30.1	27.5	228 56 14.4	4 4 58.0	27.5	277 36 40.8	4 49 41.4
28.0	198 35 47.9	1 54 41.7	28.0	235 46 5.0	4 24 17.2	28.0	283 54 59.6	4 38 48.8
28.5	205 46 9.9	+ 2 29 52.0	28.5	242 32 36.7	+ 4 39 41.1	28.5	290 9 48.7	+ 4 24 39.3
29.0	212 53 59.7	3 2 26.2	29.0	249 15 27.8	4 51 2.5	29.0	296 21 12.0	4 7 28.2
29.5	219 58 37.6	3 31 54.4	29.5	255 54 19.4	4 58 18.4	29.5	302 29 17.1	3 47 31.7
30.0	226 59 26.8	3 57 51.8	30.0	262 28 56.4	5 1 30.2	30.0	308 34 15.5	3 25 7.0
30.5	233 55 54.2	4 19 59.4	30.5	268 59 8.1	5 0 43.3	30.5	314 36 22.6	3 0 31.8
31.0	240 47 32.0	+ 4 38 4.2	31.0	275 24 49.0	+ 4 56 6.6	31.0	320 35 57.6	+ 2 34 4.1
31.5	247 33 58.8	+ 4 51 58.6	31.5	281 45 59.2	+ 4 47 51.3	31.5	326 33 23.5	+ 2 6 2.0

FOR GREENWICH MEAN NOON AND MIDNIGHT.								
Day of Month.	JULY.		Day of Month.	AUGUST.		Day of Month.	SEPTEMBER.	
	True Longitude.	Latitude.		True Longitude.	Latitude.		True Longitude.	Latitude.
1.0	320 35 57.6	+ 2 34 4.1	1.0	4 26 4.7	- 1 22 59.6	1.0	49 31 37.0	- 4 38 9.6
1.5	326 33 23.5	2 6 2.0	1.5	10 21 38.8	1 53 40.5	1.5	55 47 13.9	4 53 14.7
2.0	332 29 7.3	1 36 43.2	2.0	16 19 4.1	2 23 17.8	2.0	62 7 37.1	5 4 58.0
2.5	338 23 38.8	1 6 25.7	2.5	22 18 56.5	2 51 33.3	2.5	68 33 15.0	5 13 3.6
3.0	344 17 30.7	0 35 26.7	3.0	28 21 52.8	3 18 8.7	3.0	75 4 33.3	5 17 16.2
3.5	350 11 18.3	+ 0 4 3.4	3.5	34 28 30.3	- 3 42 45.3	3.5	81 41 55.1	- 5 17 21.9
4.0	356 5 39.1	- 0 27 26.6	4.0	40 39 25.6	4 5 4.0	4.0	88 25 39.3	5 13 8.8
4.5	2 1 12.0	0 58 46.1	4.5	46 55 14.7	4 24 45.6	4.5	95 15 58.3	5 4 27.6
5.0	7 58 37.4	1 29 37.6	5.0	53 16 31.1	4 41 30.0	5.0	102 12 58.0	4 51 12.5
5.5	13 58 35.9	1 59 43.2	5.5	59 43 45.1	4 54 57.6	5.5	109 16 36.4	4 33 22.2
6.0	20 1 48.0	- 2 28 44.0	6.0	66 17 22.9	- 5 4 48.6	6.0	116 26 42.3	- 4 11 1.0
6.5	26 8 52.9	2 56 20.8	6.5	72 57 44.6	5 10 44.1	6.5	123 42 54.3	3 44 19.4
7.0	32 20 28.8	3 22 13.4	7.0	79 45 3.1	5 12 26.9	7.0	131 4 40.4	3 13 35.4
7.5	38 37 10.9	3 46 0.7	7.5	86 39 23.2	5 9 42.0	7.5	138 31 18.4	2 39 14.6
8.0	44 50 29.9	4 7 20.7	8.0	93 40 39.7	5 2 17.9	8.0	146 1 56.4	2 1 50.3
8.5	51 27 52.0	- 4 25 51.2	8.5	100 48 37.0	- 4 50 7.7	8.5	153 35 34.0	- 1 22 2.5
9.0	58 2 37.1	4 41 9.5	9.0	108 2 48.1	4 33 10.6	9.0	161 11 4.2	- 0 40 37.3
9.5	64 43 57.3	4 52 53.5	9.5	115 22 35.4	4 11 32.3	9.5	168 47 15.8	+ 0 1 35.3
10.0	71 31 56.1	5 0 42.2	10.0	122 47 10.9	3 45 26.8	10.0	176 22 56.0	0 43 43.4
10.5	78 26 27.9	5 4 17.0	10.5	130 15 37.5	3 15 15.8	10.5	183 56 53.3	1 24 55.6
11.0	85 27 16.3	- 5 3 22.3	11.0	137 46 51.2	- 2 41 29.1	11.0	191 27 59.9	+ 2 4 23.3
11.5	92 33 54.2	4 57 46.9	11.5	145 19 43.4	2 4 43.6	11.5	198 55 14.6	2 41 22.4
12.0	99 45 46.0	4 47 25.6	12.0	152 53 3.8	1 25 42.3	12.0	206 17 44.1	3 15 15.1
12.5	107 2 6.3	4 32 19.4	12.5	160 25 43.9	0 45 12.3	12.5	213 34 44.5	3 45 30.9
13.0	114 22 2.3	4 12 36.5	13.0	167 56 35.9	- 0 4 2.4	13.0	220 45 42.3	4 11 46.6
13.5	121 44 36.4	- 3 48 32.9	13.5	175 24 42.2	+ 0 36 58.2	13.5	227 50 14.9	+ 4 33 46.4
14.0	129 8 47.8	3 20 31.7	14.0	182 49 9.9	1 17 2.7	14.0	234 48 9.2	4 51 21.1
14.5	136 33 36.0	2 49 2.7	14.5	190 9 15.9	1 55 27.9	14.5	241 39 21.7	5 4 27.4
15.0	143 58 2.5	2 14 41.2	15.0	197 24 26.3	2 31 35.5	15.0	248 23 57.3	5 13 7.3
15.5	151 21 13.1	1 38 6.9	15.5	204 34 16.6	3 4 53.3	15.5	255 2 7.9	5 17 26.3
16.0	158 42 20.0	- 1 0 2.0	16.0	211 38 31.5	+ 3 34 54.6	16.0	261 34 11.1	+ 5 17 33.4
16.5	166 0 42.5	- 0 21 9.3	16.5	218 37 3.4	4 1 18.9	16.5	268 0 29.3	5 13 39.5
17.0	173 15 48.0	+ 0 17 48.6	17.0	225 29 52.2	4 23 51.5	17.0	274 21 28.0	5 5 57.5
17.5	180 27 12.0	0 56 11.4	17.5	232 17 3.2	4 42 22.3	17.5	280 37 35.6	4 54 41.3
18.0	187 34 37.5	1 33 21.3	18.0	238 58 46.9	4 56 45.9	18.0	286 49 21.5	4 40 5.8
18.5	194 37 54.0	+ 2 8 44.1	18.5	245 35 17.3	+ 5 7 0.8	18.5	292 57 15.8	+ 4 22 26.3
19.0	201 36 57.0	2 41 49.8	19.0	252 6 51.3	5 13 8.6	19.0	299 1 48.7	4 1 58.6
19.5	208 31 46.6	3 12 12.5	19.5	258 33 47.1	5 15 13.7	19.5	305 3 30.1	3 38 59.0
20.0	215 22 26.8	3 39 0.5	20.0	264 56 24.1	5 13 22.7	20.0	311 2 48.5	3 13 44.1
20.5	222 9 3.6	4 3 26.0	20.5	271 15 2.3	5 7 44.3	20.5	317 0 11.6	2 46 30.7
21.0	228 51 44.5	+ 4 23 45.2	21.0	277 30 1.8	+ 4 58 28.8	21.0	322 56 5.3	+ 2 17 36.2
21.5	235 30 37.9	4 40 18.1	21.5	283 41 41.5	4 45 47.9	21.5	328 50 54.1	1 47 18.3
22.0	242 5 52.5	4 52 57.9	22.0	289 50 20.3	4 29 54.6	22.0	334 45 1.2	1 15 55.3
22.5	248 37 36.6	5 1 41.0	22.5	295 56 16.4	4 11 3.2	22.5	340 38 47.8	0 43 45.9
23.0	255 5 57.7	5 6 27.0	23.0	301 59 47.0	3 49 28.9	23.0	346 32 33.8	+ 0 11 9.0
23.5	261 31 3.0	+ 5 7 18.3	23.5	308 1 8.6	+ 3 25 27.9	23.5	352 26 37.7	- 0 21 36.0
24.0	267 52 58.6	5 4 19.8	24.0	314 0 37.1	2 59 17.1	24.0	358 21 17.0	0 54 9.3
24.5	274 11 50.5	4 57 38.9	24.5	319 58 28.1	2 31 14.4	24.5	4 16 48.0	1 26 11.3
25.0	280 27 43.8	4 47 25.4	25.0	325 54 56.9	2 1 38.1	25.0	10 13 26.6	1 57 22.2
25.5	286 40 44.0	4 33 50.7	25.5	331 50 19.2	1 30 47.1	25.5	16 11 28.0	2 27 22.0
26.0	292 50 57.3	+ 4 17 8.4	26.0	337 44 50.7	+ 0 59 0.6	26.0	22 11 7.3	- 2 55 51.3
26.5	298 58 30.2	3 57 33.5	26.5	343 38 47.8	+ 0 26 37.8	26.5	28 12 39.4	3 22 31.1
27.0	305 3 30.6	3 35 22.5	27.0	349 32 27.7	- 0 6 1.7	27.0	34 16 19.5	3 47 3.0
27.5	311 6 7.9	3 10 52.4	27.5	355 26 8.7	0 38 38.3	27.5	40 22 23.3	4 9 8.9
28.0	317 6 33.3	2 44 21.1	28.0	1 20 10.4	1 10 52.8	28.0	46 31 7.1	4 28 31.8
28.5	323 5 0.3	+ 2 16 7.5	28.5	7 14 53.4	- 1 42 26.2	28.5	52 42 48.0	- 4 44 55.6
29.0	329 1 44.3	1 46 30.2	29.0	13 10 40.1	2 12 59.2	29.0	58 57 43.5	4 58 5.0
29.5	334 57 3.6	1 15 48.2	29.5	19 7 54.6	2 42 13.4	29.5	65 16 12.0	5 7 46.3
30.0	340 51 19.2	0 44 20.2	30.0	25 7 2.1	3 9 50.4	30.0	71 38 32.0	5 13 46.8
30.5	346 44 54.0	+ 0 12 25.0	30.5	31 8 29.3	3 35 32.4	30.5	78 5 2.9	5 15 55.4
31.0	352 38 14.0	- 0 19 38.8	31.0	37 12 44.5	- 3 59 1.3	31.0	84 36 3.4	- 5 14 3.0
31.5	358 31 47.3	- 0 51 33.0	31.5	43 20 17.2	- 4 19 59.5	31.5	91 11 51.1	- 5 8 2.3

## FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	OCTOBER.		Day of Month.	NOVEMBER.		Day of Month.	DECEMBER.	
	True Longitude.	Latitude.		True Longitude.	Latitude.		True Longitude.	Latitude.
1.0	84 36 3.4	-5 14 3.0	1.0	135 30 40.2	-2 42 8.9	1.0	174 21 14.7	+0 51 40.0
1.5	91 11 51.1	5 8 2.3	1.5	142 31 39.9	2 8 50.9	1.5	181 26 48.8	1 28 9.5
2.0	97 52 42.4	4 57 48.5	2.0	149 36 30.2	1 33 16.6	2.0	188 33 42.9	2 3 22.0
2.5	104 38 51.2	4 43 19.9	2.5	156 45 4.1	0 55 57.1	2.5	195 41 41.8	2 36 41.7
3.0	111 30 28.3	4 24 38.3	3.0	163 57 9.3	-0 17 27.4	3.0	202 50 25.0	3 7 35.3
3.5	118 27 40.0	-4 1 49.7	3.5	171 12 26.4	+0 21 34.3	3.5	209 59 26.9	+3 35 31.1
4.0	125 30 27.0	3 35 4.7	4.0	178 30 29.0	1 0 27.5	4.0	217 8 16.5	4 0 0.9
4.5	132 38 43.7	3 4 39.5	4.5	185 50 43.5	1 38 29.6	4.5	224 16 18.5	4 20 40.8
5.0	139 52 16.5	2 30 56.8	5.0	193 12 28.1	2 14 58.1	5.0	231 22 54.3	4 37 12.1
5.5	147 10 43.8	1 54 24.2	5.5	200 34 54.5	2 49 11.7	5.5	238 27 23.4	4 49 21.2
6.0	154 33 34.3	-1 15 36.2	6.0	207 57 9.0	+3 20 31.6	6.0	245 29 4.8	+4 57 0.6
6.5	162 0 8.4	-0 35 12.8	6.5	215 18 15.2	3 48 24.0	6.5	252 27 19.3	5 0 9.0
7.0	169 29 36.9	+0 6 1.3	7.0	222 37 14.3	4 12 20.4	7.0	259 21 30.4	4 58 50.1
7.5	177 1 3.2	0 47 18.0	7.5	229 53 9.0	4 31 58.9	7.5	266 11 7.5	4 53 13.7
8.0	184 33 24.5	1 27 47.9	8.0	237 5 6.1	4 47 5.0	8.0	272 55 45.5	4 43 33.1
8.5	192 5 33.1	+2 6 42.9	8.5	244 12 17.3	+4 57 31.3	8.5	279 35 6.2	+4 30 6.1
9.0	199 36 20.8	2 43 16.4	9.0	251 14 2.5	5 3 17.2	9.0	286 8 59.6	4 13 12.3
9.5	207 4 39.1	3 16 47.4	9.5	258 9 50.4	5 4 28.6	9.5	292 37 23.1	3 53 13.7
10.0	214 29 24.1	3 46 40.9	10.0	264 59 19.7	5 1 16.2	10.0	299 0 21.9	3 30 33.1
10.5	221 49 37.3	4 12 29.3	10.5	271 42 18.8	4 53 55.1	10.5	305 18 8.2	3 5 33.5
11.0	229 4 28.9	+4 33 52.9	11.0	278 18 46.0	+4 42 43.1	11.0	311 31 1.2	+2 38 37.7
11.5	236 13 18.4	4 50 40.3	11.5	284 48 49.1	4 28 0.1	11.5	317 39 25.2	2 10 7.8
12.0	243 15 36.6	5 2 46.4	12.0	291 12 43.5	4 10 7.0	12.0	323 43 49.9	1 40 24.8
12.5	250 11 4.3	5 10 13.0	12.5	297 30 52.2	3 49 25.2	12.5	329 44 49.0	1 9 49.2
13.0	256 59 33.5	5 13 7.5	13.0	303 43 43.5	3 26 15.6	13.0	335 42 59.8	0 38 40.0
13.5	263 41 5.9	+5 11 41.0	13.5	309 51 50.6	+3 0 58.7	13.5	341 39 1.1	+0 7 15.5
14.0	270 15 52.4	5 6 7.8	14.0	315 55 50.6	2 33 55.0	14.0	347 33 34.4	-0 24 6.6
14.5	276 44 10.8	4 56 44.3	14.5	321 56 22.6	2 5 23.2	14.5	353 27 21.7	0 55 9.5
15.0	283 6 25.8	4 43 47.9	15.0	327 54 7.6	1 35 41.6	15.0	359 21 5.6	1 25 36.6
15.5	289 23 6.5	4 27 37.1	15.5	333 49 47.4	1 5 8.4	15.5	5 15 28.3	1 55 11.1
16.0	295 34 46.0	+4 8 30.2	16.0	339 44 3.7	+0 34 0.8	16.0	11 11 11.4	-2 23 36.9
16.5	301 41 59.7	3 46 45.5	16.5	345 37 37.4	0 2 36.2	16.5	17 8 54.1	2 50 37.0
17.0	307 45 24.4	3 22 41.3	17.0	351 31 8.5	-0 28 48.5	17.0	23 9 14.0	3 15 54.3
17.5	313 45 38.1	2 56 35.2	17.5	357 25 15.4	0 59 55.9	17.5	29 12 45.8	3 39 11.6
18.0	319 43 18.4	2 28 45.0	18.0	3 20 33.4	1 30 28.7	18.0	35 20 0.6	4 0 10.8
18.5	325 39 2.2	+1 59 27.9	18.5	9 17 35.6	-2 0 8.8	18.5	41 31 24.6	-4 18 34.2
19.0	331 33 25.2	1 29 1.6	19.0	15 16 52.0	2 28 38.0	19.0	47 47 19.8	4 34 3.9
19.5	337 27 1.8	0 57 43.4	19.5	21 18 48.7	2 55 37.4	19.5	54 8 2.3	4 46 22.1
20.0	343 20 23.8	+0 25 51.0	20.0	27 23 47.8	3 20 48.1	20.0	60 33 41.8	4 55 12.7
20.5	349 14 1.1	-0 6 17.6	20.5	33 32 7.5	3 43 50.5	20.5	67 4 22.1	5 0 20.4
21.0	355 8 21.1	-0 38 23.8	21.0	39 44 1.1	-4 4 25.7	21.0	73 39 59.8	-5 1 32.6
21.5	1 3 48.2	1 10 9.0	21.5	45 59 37.9	4 22 15.3	21.5	80 20 25.0	4 58 39.4
22.0	7 0 44.6	1 41 13.7	22.0	52 19 1.8	4 37 1.2	22.0	87 5 22.0	4 51 34.4
22.5	12 59 29.2	2 11 18.5	22.5	58 42 13.1	4 48 27.2	22.5	93 54 29.2	4 40 15.7
23.0	19 0 18.5	2 40 3.5	23.0	65 9 7.7	4 56 18.5	23.0	100 47 20.5	4 24 46.4
23.5	25 3 26.0	-3 7 9.0	23.5	71 39 38.0	-5 0 23.3	23.5	107 43 26.2	-4 5 14.4
24.0	31 9 3.0	3 32 15.2	24.0	78 13 33.6	5 0 31.8	24.0	114 42 15.4	3 41 53.2
24.5	37 17 18.7	3 55 3.1	24.5	84 50 42.0	4 56 38.4	24.5	121 43 15.7	3 15 1.5
25.0	43 28 20.3	4 15 14.4	25.0	91 30 49.4	4 48 40.8	25.0	128 45 55.5	2 45 2.4
25.5	49 42 12.6	4 32 31.6	25.5	98 13 41.7	4 36 40.5	25.5	135 49 45.2	2 12 23.6
26.0	55 59 0.0	-4 46 38.5	26.0	104 59 5.2	-4 20 42.8	26.0	142 54 18.4	-1 37 36.5
26.5	62 18 45.7	4 57 21.3	26.5	111 46 47.2	4 0 57.4	26.5	149 59 11.9	1 1 14.4
27.0	68 41 32.4	5 4 27.3	27.0	118 36 37.3	3 37 38.0	27.0	157 4 6.1	-0 23 53.2
27.5	75 7 23.2	5 7 46.4	27.5	125 28 26.6	3 11 2.0	27.5	164 8 46.1	+0 13 50.7
28.0	81 36 21.2	5 7 10.8	28.0	132 22 9.2	2 41 29.9	28.0	171 12 59.9	0 51 20.8
28.5	88 8 30.7	-5 2 35.5	28.5	139 17 40.3	-2 9 26.2	28.5	178 16 38.2	+1 28 1.4
29.0	94 43 56.0	4 53 58.3	29.0	146 14 57.6	1 35 17.6	29.0	185 19 34.2	2 3 18.0
29.5	101 22 42.9	4 41 19.7	29.5	153 13 59.5	0 59 34.0	29.5	192 21 41.9	2 36 37.7
30.0	108 4 57.5	4 24 43.8	30.0	160 14 44.3	-0 22 47.3	30.0	199 22 56.0	3 7 30.5
30.5	114 50 46.5	4 4 18.2	30.5	167 17 10.8	+0 14 29.1	30.5	206 23 10.2	3 35 28.8
31.0	121 40 16.4	-3 40 13.5	31.0	174 21 14.7	+0 51 40.0	31.0	213 22 17.6	+4 0 8.4
31.5	128 33 32.9	-3 12 44.1	31.5	181 26 48.8	+1 28 9.5	31.5	220 20 8.8	+4 21 8.2



QUANTITIES REQUIRED IN COMPUTING THE  
MOON'S LIBRATION.ARGUMENT,  $(\Omega - \lambda)$ , or  $(\Omega - \lambda - 180^\circ)$ .SUN'S ABERRATION AND HORI-  
ZONTAL PARALLAX.

FOR GREENWICH MEAN NOON.

$\Omega - \lambda$	$\mu$	$A$	$B$	$\Omega - \lambda$	Date.	Aberration. (Struve.)	Hor. Par.
0	0.0	39	0 0.0	180	1904.	"	"
2	0.0	39	0 3.1	178	Jan. 1	— 20.79	8.95
4	0.1	39	0 6.2	176	11	20.78	8.95
6	0.2	39	0 9.3	174	21	20.77	8.94
8	0.2	39	0 12.4	172	31	20.75	8.93
					Feb. 10	20.71	8.92
10	0.2	39	0 15.4	170	20	— 20.66	8.90
12	0.3	40	0 18.5	168	March 1	20.61	8.88
14	0.3	40	0 21.5	166	11	20.56	8.85
16	0.3	40	0 24.5	164	21	20.50	8.83
18	0.3	41	0 27.4	162	31	20.44	8.81
20	0.4	41	0 30.4	160	April 10	— 20.38	8.78
22	0.4	42	0 33.2	158	20	20.33	8.75
24	0.4	42	0 36.1	156	30	20.28	8.73
26	0.5	43	0 38.9	154	May 10	20.23	8.71
28	0.5	44	0 41.7	152	20	20.19	8.69
30	0.5	45	0 44.4	150	30	— 20.16	8.68
32	0.5	46	0 47.0	148	June 9	20.13	8.67
34	0.5	47	0 49.7	146	19	20.11	8.66
36	0.5	48	0 52.2	144	29	20.10	8.65
38	0.6	49	0 54.7	142	July 9	20.10	8.66
40	0.6	50	0 57.1	140	19	— 20.11	8.66
42	0.6	52	0 59.4	138	29	20.13	8.67
44	0.6	54	1 1.7	136	Aug. 8	20.16	8.68
46	0.6	56	1 3.9	134	18	20.20	8.70
48	0.6	58	1 6.0	132	28	20.25	8.72
50	0.6	60	1 8.0	130	Sept. 7	— 20.30	8.74
52	0.6	63	1 10.0	128	17	20.35	8.76
54	0.5	66	1 11.8	126	27	20.41	8.78
56	0.5	69	1 13.6	124	Oct. 7	20.47	8.81
58	0.5	73	1 15.3	122	17	20.53	8.83
60	0.5	77	1 16.9	120	27	— 20.59	8.86
62	0.5	83	1 18.4	118	Nov. 6	20.64	8.88
64	0.5	89	1 19.8	116	16	20.68	8.90
66	0.4	95	1 21.1	114	26	20.72	8.92
68	0.4	103	1 22.3	112	Dec. 6	20.75	8.93
70	0.4	113	1 23.4	110	16	— 20.77	8.94
72	0.4	125	1 24.4	108	26	20.79	8.95
74	0.3	141	1 25.3	106	36	— 20.79	8.95
76	0.3	160	1 26.1	104			
78	0.2	186	1 26.8	102			
80	0.2	222	1 27.4	100			
82	0.2	278	1 27.9	98			
84	0.1	370	1 28.3	96			
86	0.1	554	1 28.6	94			
88	0.0	1110	1 28.7	92			
90	0.0	$\infty$	1 28.8	90			

 $\mu$  has the sign of  $\tan (\lambda - \Omega)$  $A$  has the sign of  $\cos (\Omega - \lambda)$  $B$  has the sign of  $\sin (\Omega - \lambda)$ 

See formulæ, page 440.

Sun's Mean Equatorial Horizontal  
Parallax. $8''.80; \log = 0.94448.$

FOR GREENWICH MEAN NOON.											
Date.	Precession in Longitude from 1904.0.	Nutation.			Obliquity of Ecliptic. (Peters.)	Date.	Precession in Longitude from 1904.0.	Nutation.			Obliquity of Ecliptic. (Peters.)
		In Longi- tude.	In R. A.	In Obliq- uity.				In Longi- tude.	In R. A.	In Obliq- uity.	
					23° 26'						23° 26'
	"	"	s	"	"		"	"	s	"	"
Jan. 0	- 0.18	+ 0.96	+ 0.058	- 9.84	56.05	July 3	+ 25.28	- 1.96	- 0.120	- 9.72	55.94
5	+ 0.51	1.10	0.067	9.80	56.09	8	25.97	1.87	0.114	9.68	55.98
10	1.20	1.22	0.074	9.75	56.13	13	26.66	1.79	0.110	9.62	56.04
15	1.89	1.31	0.080	9.69	56.19	18	27.35	1.74	0.106	9.54	56.10
20	2.58	1.38	0.084	9.61	56.26	23	28.04	1.71	0.105	9.46	56.18
25	+ 3.26	+ 1.41	+ 0.086	- 9.52	56.34	28	+ 28.72	- 1.71	- 0.105	- 9.37	56.26
30	3.95	1.41	0.086	9.43	56.43	Aug. 2	29.41	1.75	0.107	9.28	56.35
Feb. 4	4.64	1.36	0.083	9.33	56.52	7	30.10	1.82	0.111	9.18	56.44
9	5.33	1.27	0.078	9.24	56.61	12	30.79	1.92	0.118	9.08	56.53
14	6.02	1.15	0.070	9.14	56.70	17	31.48	2.06	0.126	8.98	56.62
19	+ 6.70	+ 0.99	+ 0.060	- 9.05	56.79	22	+ 32.16	- 2.23	- 0.137	- 8.89	56.71
24	7.39	0.79	0.048	8.97	56.86	27	32.85	2.44	0.149	8.80	56.79
29	8.08	0.56	0.034	8.90	56.93	Sept. 1	33.54	2.67	0.163	8.73	56.86
Mar. 5	8.77	0.30	0.019	8.84	56.98	6	34.23	2.92	0.179	8.66	56.92
10	9.46	+ 0.03	+ 0.002	8.80	57.02	11	34.92	3.20	0.196	8.61	56.97
15	+ 10.15	- 0.26	- 0.016	- 8.77	57.04	16	+ 35.61	- 3.49	- 0.213	- 8.57	57.00
20	10.83	0.56	0.034	8.75	57.05	21	36.29	3.78	0.231	8.55	57.01
25	11.52	0.86	0.052	8.76	57.04	26	36.98	4.08	0.249	8.54	57.01
30	12.21	1.15	0.070	8.78	57.01	Oct. 1	37.67	4.37	0.267	8.55	57.00
Apr. 4	12.90	1.43	0.088	8.81	56.97	6	38.36	4.66	0.285	8.58	56.97
9	+ 13.59	- 1.70	- 0.104	- 8.86	56.91	11	+ 39.05	- 4.92	- 0.301	- 8.62	56.92
14	14.27	1.94	0.119	8.92	56.85	16	39.73	5.16	0.316	8.67	56.86
19	14.96	2.16	0.132	8.99	56.77	21	40.42	5.38	0.329	8.73	56.79
24	15.65	2.34	0.143	9.07	56.68	26	41.11	5.56	0.340	8.80	56.71
29	16.34	2.49	0.153	9.16	56.59	31	41.80	5.71	0.349	8.88	56.63
May 4	+ 17.03	- 2.61	- 0.160	- 9.25	56.50	Nov. 5	+ 42.49	- 5.82	- 0.356	- 8.97	56.54
9	17.71	2.69	0.165	9.33	56.40	10	43.17	5.89	0.360	9.05	56.45
14	18.40	2.74	0.168	9.42	56.31	15	43.86	5.92	0.362	9.14	56.36
19	19.09	2.75	0.168	9.50	56.22	20	44.55	5.91	0.362	9.22	56.27
24	19.78	2.73	0.167	9.58	56.14	25	45.24	5.87	0.359	9.29	56.19
29	+ 20.47	- 2.69	- 0.164	- 9.64	56.07	30	+ 45.93	- 5.79	- 0.354	- 9.35	56.12
June 3	21.16	2.62	0.160	9.70	56.01	Dec. 5	46.61	5.68	0.348	9.40	56.07
8	21.84	2.53	0.155	9.74	55.96	10	47.30	5.55	0.340	9.44	56.03
13	22.53	2.42	0.148	9.77	55.93	15	47.99	5.40	0.331	9.46	56.00
18	23.22	2.31	0.141	9.78	55.91	20	48.68	5.24	0.321	9.46	55.99
23	+ 23.91	- 2.19	- 0.134	- 9.77	55.90	25	+ 49.37	- 5.08	- 0.311	- 9.44	56.00
28	24.60	2.07	0.126	9.76	55.91	30	50.06	4.93	0.302	9.41	56.03
July 3	+ 25.28	- 1.96	- 0.120	- 9.72	55.94	35	+ 50.74	- 4.78	- 0.293	- 9.36	56.07
						Mean Obliquity, 1904.0.					
Precession for 1904 (Struve). 50.2648 log = 1.70126						Peters . . . . . 23 27 5.90					
Precession in a Solar day . . 0.1376 log = 9.13868						Hansen . . . . . 23 27 6.15					
Precession in a Sidereal day . 0.1372 log = 9.13750						Le Verrier . . . . . 23 27 6.13					
						Newcomb . . . . . 23 27 6.39					



## FOR GREENWICH MEAN NOON.

Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$
	"	"		"	"		"	"		"	"
Jan. 1	-0.14	-0.07	Feb. 15	+0.17	0.00	Apr. 1	-0.09	+0.06	May 16	-0.18	-0.05
2	-0.04	0.07	16	0.14	+0.03	2	0.11	+0.02	17	0.11	0.07
3	+0.07	0.06	17	0.09	0.05	3	0.10	-0.02	18	-0.02	0.08
4	0.15	0.04	18	+0.02	0.06	4	-0.06	0.05	19	+0.07	0.06
5	0.20	-0.01	19	-0.07	0.07	5	+0.01	0.07	20	0.14	-0.03
6	0.19	+0.03	20	0.14	0.06	6	0.08	0.07	21	0.17	0.00
7	0.15	0.06	21	0.21	0.04	7	0.14	0.06	22	0.15	+0.04
8	+0.08	0.07	22	0.25	+0.01	8	0.17	0.04	23	0.10	0.07
9	0.00	0.07	23	0.25	-0.02	9	0.19	-0.02	24	+0.02	0.08
10	-0.07	0.05	24	0.21	0.05	10	0.17	+0.01	25	-0.07	0.07
11	-0.10	+0.01	25	-0.14	-0.07	11	+0.14	+0.03	26	-0.12	+0.04
12	0.10	-0.02	26	-0.04	0.07	12	0.08	0.05	27	0.13	+0.01
13	0.06	0.05	27	+0.06	0.06	13	+0.01	0.07	28	0.11	-0.03
14	-0.01	0.06	28	0.13	-0.03	14	-0.07	0.06	29	-0.06	0.05
15	+0.06	0.07	29	0.17	+0.01	15	0.14	0.05	30	+0.01	0.07
16	0.11	0.06	Mar. 1	0.15	0.04	16	0.20	+0.03	31	0.08	0.07
17	0.15	0.04	2	0.11	0.07	17	0.23	0.00	June 1	0.14	0.07
18	0.16	-0.02	3	+0.04	0.08	18	0.22	-0.03	2	0.18	0.03
19	0.15	+0.01	4	-0.03	0.06	19	0.18	0.06	3	0.18	-0.01
20	0.12	0.03	5	0.08	0.04	20	-0.09	0.07	4	0.16	+0.02
21	+0.05	+0.04	6	-0.10	+0.01	21	+0.01	-0.07	5	+0.11	+0.04
22	-0.02	0.06	7	0.08	-0.03	22	0.09	0.05	6	+0.05	0.06
23	0.10	0.07	8	-0.03	0.05	23	0.14	-0.02	7	-0.03	0.07
24	0.17	0.05	9	+0.04	0.07	24	0.16	+0.02	8	0.11	0.06
25	0.23	+0.03	10	0.10	0.07	25	0.12	0.05	9	0.17	0.05
26	0.26	0.00	11	0.15	0.05	26	+0.06	0.07	10	0.22	+0.02
27	0.24	-0.03	12	0.18	0.03	27	-0.02	0.08	11	0.23	-0.01
28	0.18	0.06	13	0.18	-0.01	28	0.09	0.06	12	0.20	0.04
29	-0.09	0.07	14	0.16	+0.02	29	0.12	+0.03	13	0.14	0.06
30	+0.01	0.07	15	0.12	0.04	30	0.13	-0.01	14	-0.06	0.08
31	+0.12	-0.05	16	+0.05	+0.06	May 1	-0.09	-0.04	15	+0.05	-0.07
Feb. 1	0.17	-0.02	17	-0.03	0.07	2	-0.03	0.06	16	0.13	0.05
2	0.19	+0.02	18	0.10	0.06	3	+0.05	0.07	17	0.17	-0.01
3	0.16	0.05	19	0.17	0.05	4	0.11	0.07	18	0.17	+0.03
4	0.10	0.07	20	0.22	+0.02	5	0.16	0.05	19	0.13	0.06
5	+0.03	0.07	21	0.24	-0.01	6	0.19	-0.02	20	+0.06	0.08
6	-0.05	0.05	22	0.22	0.04	7	0.18	0.00	21	-0.03	0.07
7	0.09	+0.03	23	0.16	0.06	8	0.16	+0.03	22	0.09	0.05
8	0.09	-0.01	24	-0.07	0.08	9	0.10	0.05	23	0.13	+0.02
9	0.07	0.04	25	+0.02	0.07	10	+0.03	0.06	24	0.12	-0.02
10	-0.02	-0.06	26	+0.10	-0.04	11	-0.05	+0.07	25	-0.08	-0.05
11	+0.05	0.07	27	0.15	-0.01	12	0.12	0.06	26	-0.02	0.07
12	0.11	0.06	28	0.15	+0.03	13	0.18	0.04	27	+0.06	0.07
13	0.15	0.04	29	0.11	0.06	14	0.22	+0.01	28	0.12	0.06
14	0.17	-0.02	30	+0.04	0.08	15	0.22	-0.02	29	0.17	0.04
15	0.17	0.00	31	-0.03	0.08	16	0.18	0.05	30	0.18	-0.02
16	+0.14	+0.03	Apr. 1	-0.09	+0.06	17	-0.11	-0.07	July 1	+0.17	+0.01

## 288 TERMS OF SHORT PERIOD IN THE NUTATION, 1904.

FOR GREENWICH MEAN NOON.											
Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$
	"	"		"	"		"	"		"	"
July 1	+ 0.17	+ 0.01	Aug. 16	- 0.08	+ 0.04	Oct. 1	- 0.11	- 0.07	Nov. 16	+ 0.14	+ 0.05
2	0.13	0.04	17	0.10	+ 0.01	2	- 0.03	0.07	17	+ 0.07	0.06
3	+ 0.07	0.06	18	0.09	- 0.02	3	+ 0.06	0.05	18	- 0.01	0.07
4	- 0.01	0.07	19	- 0.04	0.05	4	0.12	- 0.03	19	0.09	0.06
5	0.09	0.06	20	+ 0.04	0.07	5	0.13	+ 0.01	20	0.15	0.04
6	0.16	0.05	21	0.11	0.07	6	0.11	0.04	21	0.20	+ 0.02
7	0.22	+ 0.03	22	0.16	0.05	7	+ 0.06	0.07	22	0.22	0.01
8	0.24	0.00	23	0.19	0.03	8	- 0.02	0.08	23	0.20	0.04
9	0.23	- 0.03	24	0.19	- 0.01	9	0.09	0.06	24	0.14	0.06
10	0.18	0.06	25	0.17	+ 0.02	10	0.13	+ 0.03	25	- 0.06	0.08
11	- 0.09	- 0.08	26	+ 0.12	+ 0.04	11	- 0.12	- 0.01	26	+ 0.03	0.07
12	+ 0.01	0.07	27	+ 0.05	0.06	12	0.08	0.04	27	0.10	0.05
13	0.10	0.05	28	- 0.03	0.07	13	- 0.02	0.06	28	0.15	- 0.02
14	0.16	- 0.02	29	0.11	0.06	14	+ 0.07	0.07	29	0.15	+ 0.02
15	0.18	+ 0.02	30	0.18	0.05	15	0.14	0.07	30	0.10	0.05
16	0.16	0.05	31	0.23	+ 0.02	16	0.19	0.05	Dec. 1	+ 0.03	0.08
17	0.10	0.07	Sept. 1	0.24	- 0.01	17	0.22	- 0.02	2	- 0.05	0.07
18	+ 0.02	0.07	2	0.23	0.04	18	0.21	+ 0.01	3	0.12	0.06
19	- 0.06	0.06	3	0.17	0.06	19	0.17	0.03	4	0.15	+ 0.02
20	0.10	+ 0.03	4	- 0.09	0.08	20	0.11	0.05	5	0.14	- 0.02
21	- 0.11	- 0.01	5	+ 0.01	- 0.07	21	+ 0.04	+ 0.06	6	- 0.09	- 0.05
22	0.08	0.04	6	0.09	0.05	22	- 0.04	0.07	7	- 0.02	0.07
23	- 0.03	0.06	7	0.14	- 0.01	23	0.12	0.06	8	+ 0.07	0.07
24	+ 0.05	0.07	8	0.15	+ 0.03	24	0.18	0.04	9	0.14	0.06
25	0.11	0.07	9	0.11	0.06	25	0.21	+ 0.01	10	0.19	0.04
26	0.16	0.05	10	+ 0.05	0.07	26	0.22	- 0.02	11	0.21	- 0.01
27	0.18	- 0.02	11	- 0.03	0.07	27	0.19	0.05	12	0.19	+ 0.02
28	0.18	+ 0.01	12	0.08	0.05	28	0.14	0.07	13	0.15	0.04
29	0.15	0.03	13	0.11	+ 0.02	29	- 0.05	0.07	14	0.09	0.06
30	0.09	0.05	14	0.10	- 0.02	30	+ 0.04	0.06	15	+ 0.01	0.07
31	+ 0.02	+ 0.06	15	- 0.05	- 0.05	31	+ 0.11	- 0.04	16	- 0.07	+ 0.06
Aug. 1	- 0.06	0.06	16	+ 0.02	0.07	Nov. 1	0.14	0.00	17	0.14	0.05
2	0.14	0.06	17	0.10	0.07	2	0.12	+ 0.03	18	0.19	+ 0.03
3	0.20	0.04	18	0.16	0.06	3	+ 0.07	0.06	19	0.22	0.00
4	0.24	+ 0.02	19	0.20	0.04	4	- 0.01	0.07	20	0.21	- 0.03
5	0.25	- 0.02	20	0.21	- 0.01	5	0.08	0.07	21	0.17	0.05
6	0.21	0.05	21	0.19	+ 0.02	6	0.13	0.05	22	- 0.09	0.07
7	0.14	0.07	22	0.15	0.04	7	0.15	+ 0.01	23	0.00	0.07
8	- 0.05	0.07	23	0.08	0.05	8	0.12	- 0.03	24	+ 0.09	0.06
9	+ 0.05	0.06	24	+ 0.01	0.06	9	- 0.06	0.05	25	0.15	- 0.03
10	+ 0.12	- 0.04	25	- 0.07	+ 0.06	10	+ 0.03	- 0.07	26	+ 0.16	+ 0.01
11	0.16	0.00	26	0.14	0.05	11	0.11	0.07	27	0.14	0.04
12	0.16	+ 0.03	27	0.20	+ 0.03	12	0.17	0.05	28	+ 0.08	0.07
13	0.11	0.06	28	0.23	0.00	13	0.21	- 0.03	29	- 0.01	0.08
14	+ 0.04	0.07	29	0.23	- 0.03	14	0.21	0.00	30	0.09	0.06
15	- 0.04	0.07	30	0.19	0.05	15	0.19	+ 0.03	31	0.14	+ 0.04
16	- 0.08	+ 0.04	Oct. 1	- 0.11	- 0.07	16	+ 0.14	+ 0.05	32	- 0.15	0.00

PART II

---

ASTRONOMICAL EPHEMERIS

FOR THE

MERIDIAN OF WASHINGTON.

FORMULÆ FOR THE REDUCTION OF THE POSITIONS OF THE FIXED STARS, USING THE NOTATION OF BESSEL, AND THE CONSTANTS OF STRUVE AND PETERS.

NOTATION.

- $\tau$ , the time, reckoned in units of one year, from the beginning of the Besselian fictitious year, (1904, January 1<sup>d</sup>.068, Washington mean time),  
 $a_0, \delta_0$ , the star's mean right ascension and declination at the beginning of the fictitious year,  
 $\alpha, \delta$ , the star's apparent right ascension and declination at the time  $\tau$ ,  
 $\mu, \mu'$ , the annual proper motion in right ascension and declination,  
 $\odot$ , the Sun's true longitude,  
 $\Omega$ , the longitude of the Moon's ascending node,  
 $\omega$ , the obliquity of the ecliptic,  
 $\Gamma$ , the longitude of the Sun's perigee,  
 $\Gamma'$ , the longitude of the Moon's perigee,  
 $\zeta$ , the Moon's mean longitude.

BESSELIAN STAR-NUMBERS.

$$\begin{aligned} A &= \tau - 0.342\ 53 \sin \Omega \\ &\quad + 0.004\ 10 \sin 2\ \Omega \\ &\quad - 0.025\ 19 \sin 2\ \odot \\ &\quad + 0.002\ 93 \sin (\odot + 81^\circ\ 54') \\ &\quad - 0.004\ 05 \sin 2\ \zeta \\ &\quad + 0.001\ 35 \sin (\zeta - \Gamma') \\ A' &= \tau - 0.342\ 53 \sin \Omega \\ &\quad + 0.004\ 10 \sin 2\ \Omega \\ &\quad - 0.025\ 19 \sin 2\ \odot \\ &\quad + 0.002\ 93 \sin (\odot + 81^\circ\ 54') \\ B &= -9.2240 \cos \Omega \\ &\quad + 0.0895 \cos 2\ \Omega \\ &\quad - 0.5506 \cos 2\ \odot \\ &\quad - 0.0092 \cos (\odot + 281^\circ\ 17') \\ &\quad - 0.0885 \cos 2\ \zeta \\ B' &= -9.2240 \cos \Omega \\ &\quad + 0.0895 \cos 2\ \Omega \\ &\quad - 0.5506 \cos 2\ \odot \\ &\quad - 0.0092 \cos (\odot + 281^\circ\ 17') \\ C &= -20.4451 \cos \omega \cos \odot \\ D &= -20.4451 \sin \odot \\ E &= -0.0446 \sin \Omega + 0''.0014 \sin 2\ \Omega - 0''.0032 \sin 2\ \odot \end{aligned}$$

BESSEL'S Star-Constants.

$$\begin{aligned} a &= 3^s.072\ 80 + 1^s.336\ 78 \sin a_0 \tan \delta_0 = \text{precession in right ascension} \\ b &= \frac{1}{15} \cos a_0 \tan \delta_0 \\ c &= \frac{1}{15} \cos a_0 \sec \delta_0 \\ d &= \frac{1}{15} \sin a_0 \sec \delta_0 \\ a' &= 20''.0517 \cos a_0 = \text{precession in declination} \\ b' &= -\sin a_0 \\ c' &= \tan \omega \cos \delta_0 - \sin a_0 \sin \delta_0 \\ d' &= \cos a_0 \sin \delta_0 \end{aligned}$$

Reduction to Apparent Position.

$$\begin{aligned} \alpha &= a_0 + \tau \mu + Aa + Bb + Cc + Dd + \frac{1}{15} E & (\text{in time}) \\ \delta &= \delta_0 + \tau \mu' + Aa' + Bb' + Cc' + Dd' & (\text{in arc}) \end{aligned}$$

INDEPENDENT STAR-NUMBERS.

$$\begin{aligned} f &= 46''.0919 A + E \text{ (in arc)} = 3^s.072\ 80 A + \frac{1}{15} E & (\text{in time}) \\ f' &= 46''.0919 A' + E \text{ (in arc)} = 3^s.072\ 80 A' + \frac{1}{15} E & (\text{in time}) \\ g \sin G &= B & g' \sin G' &= B' & h \sin H &= C & i &= C \tan \omega \\ g \cos G &= 20''.0517 A & g' \cos G' &= 20''.0517 A' & h \cos H &= D \end{aligned}$$

Reduction to Apparent Position.

$$\begin{aligned} \alpha &= a_0 + f + \tau \mu + \frac{1}{15} g \sin (G + a_0) \tan \delta_0 + \frac{1}{15} h \sin (H + a_0) \sec \delta_0 & (\text{in time}) \\ \delta &= \delta_0 + \tau \mu' + g \cos (G + a_0) + h \cos (H + a_0) \sin \delta_0 + i \cos \delta_0 & (\text{in arc}) \end{aligned}$$

- NOTES.—(1) The quantities  $A', B', f', g'$ , and  $G'$  are to be used instead of  $A, B, f, g$ , and  $G$  whenever it is necessary to omit the short period terms, as, for example, in computing the ephemeris of a star at ten-day intervals.  
 (2) The independent star-numbers are more convenient, when only one or two apparent positions of a star are required, or when BESSEL'S star-constants are not known with sufficient accuracy. Otherwise, the Besselian star-numbers are more convenient.  
 (3) In using the star-constants of the *British Association Catalogue*,  $a, b, c, d, a', b', c', d'$ , with the star-numbers of this Ephemeris, the quantities to be formed are  $Ac, Bd, Ca, Db, -Ac', -Bd', -Ca', -Db'$ .

# BESSELIAN STAR-NUMBERS, 1904.

291

(CONSTANTS OF STRUVE AND PETERS.)

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.
Jan. 0	+ 8.17464	+ 0.9964	- 0.48534	+ 1.30474	Feb. 15	+ 9.17624	+ 0.9582	- 1.19236	+ 1.05673
1	8.30685	0.9965	0.52967	1.30340	16	9.17875	0.9556	1.19740	1.04511
2	8.40807	0.9958	0.56977	1.30190	17	9.17944	0.9537	1.20225	1.03304
3	8.48473	0.9943	0.60635	1.30027	18	9.17938	0.9526	1.20691	1.02048
4	8.54195	0.9923	0.63996	1.29850	19	9.17955	0.9524	1.21138	1.00742
h					h				
(7.0) 5	+ 8.58309	+ 0.9901	- 0.67104	+ 1.29658	(10.0) 20	+ 9.18101	+ 0.9530	- 1.21568	+ 0.99382
6	8.61162	0.9881	0.69990	1.29451	21	9.18478	0.9541	1.21979	0.97965
7	8.63205	0.9866	0.72684	1.29229	22	9.19095	0.9552	1.22374	0.96488
8	8.64816	0.9859	0.75208	1.28993	23	9.19921	0.9561	1.22751	0.94945
9	8.66379	0.9860	0.77580	1.28741	24	9.20906	0.9563	1.23111	0.93332
10	+ 8.68223	+ 0.9867	- 0.79816	+ 1.28474	25	+ 9.21935	+ 0.9557	- 1.23455	+ 0.91644
11	8.70552	0.9879	0.81930	1.28192	26	9.22904	0.9542	1.23783	0.89875
12	8.73344	0.9891	0.83932	1.27894	27	9.23734	0.9520	1.24095	0.88019
13	8.76470	0.9900	0.85833	1.27580	28	9.24366	0.9495	1.24392	0.86066
14	8.79747	0.9902	0.87641	1.27250	29	9.24778	0.9469	1.24673	0.84008
15	+ 8.82898	+ 0.9897	- 0.89363	+ 1.26903	Mar. 1	+ 9.24991	+ 0.9447	- 1.24939	+ 0.81835
16	8.85709	0.9883	0.91006	1.26540	2	9.25071	0.9433	1.25190	0.79535
17	8.88013	0.9862	0.92576	1.26160	3	9.25098	0.9428	1.25426	0.77093
18	8.89763	0.9838	0.94077	1.25764	4	9.25164	0.9432	1.25647	0.74493
19	8.90993	0.9812	0.95515	1.25349	5	9.25348	0.9444	1.25854	0.71715
h					h				
(8.0) 20	+ 8.91766	+ 0.9790	- 0.96893	+ 1.24917	(11.0) 6	+ 9.25691	+ 0.9459	- 1.26047	+ 0.68733
21	8.92267	0.9775	0.98215	1.24467	7	9.26214	0.9473	1.26226	0.65520
22	8.92681	0.9767	0.99485	1.23998	8	9.26883	0.9483	1.26391	0.62036
23	8.93207	0.9768	1.00704	1.23510	9	9.27635	0.9486	1.26542	0.58236
24	8.94017	0.9775	1.01877	1.23004	10	9.28377	0.9481	1.26679	0.54059
25	+ 8.95211	+ 0.9785	- 1.03005	+ 1.22477	11	+ 9.29030	+ 0.9467	- 1.26803	+ 0.49425
26	8.96788	0.9794	1.04091	1.21931	12	9.29528	0.9447	1.26913	0.44224
27	8.98655	0.9799	1.05137	1.21363	13	9.29842	0.9424	1.27009	0.38302
28	9.00664	0.9796	1.06145	1.20775	14	9.29970	0.9403	1.27092	0.31433
29	9.02629	0.9786	1.07116	1.20165	15	9.29944	0.9388	1.27162	0.23257
30	+ 9.04407	+ 0.9767	- 1.08052	+ 1.19533	16	+ 9.29839	+ 0.9381	- 1.27219	+ 0.13167
31	9.05892	0.9743	1.08955	1.18877	17	9.29732	0.9383	1.27262	9.99989
Feb. 1	9.07030	0.9715	1.09826	1.18198	18	9.29708	0.9394	1.27293	9.80975
2	9.07824	0.9688	1.10666	1.17495	19	9.29839	0.9411	1.27310	+ 9.46362
3	9.08343	0.9666	1.11477	1.16766	20	9.30162	0.9431	1.27314	- 8.80288
h					h				
(9.0) 4	+ 9.08686	+ 0.9652	- 1.12259	+ 1.16011	(12.0) 21	+ 9.30677	+ 0.9449	- 1.27305	- 9.62079
5	9.08987	0.9646	1.13014	1.15230	22	9.31334	0.9462	1.27284	9.88726
6	9.09370	0.9648	1.13742	1.14420	23	9.32071	0.9466	1.27249	0.05102
7	9.09940	0.9656	1.14445	1.13581	24	9.32799	0.9462	1.27201	0.16949
8	9.10755	0.9666	1.15123	1.12712	25	9.33443	0.9450	1.27140	0.26232
9	+ 9.11787	+ 0.9674	- 1.15777	+ 1.11812	26	+ 9.33949	+ 0.9433	- 1.27066	- 0.33860
10	9.12969	0.9676	1.16408	1.10880	27	9.34295	0.9415	1.26979	0.40331
11	9.14201	0.9671	1.17016	1.09913	28	9.34476	0.9400	1.26879	0.45947
12	9.15372	0.9658	1.17603	1.08911	29	9.34541	0.9391	1.26766	0.50905
13	9.16373	0.9636	1.18168	1.07871	30	9.34549	0.9392	1.26640	0.55340
14	+ 9.17137	+ 0.9610	- 1.18712	+ 1.06793	31	+ 9.34565	+ 0.9401	- 1.26500	- 0.59350
15	+ 9.17624	+ 0.9582	- 1.19236	+ 1.05673	Apr. 1	+ 9.34661	+ 0.9419	- 1.26348	- 0.63007

E = 0".00 = 0".000

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.
<b>Apr.</b>					<b>May</b>				
1	+9.34661	+0.9419	-1.26348	-0.63007	17	+9.50709	+0.9809	-1.01129	-1.23331
2	9.34893	0.9442	1.26181	0.66366	18	9.51328	0.9808	0.99992	1.23800
3	9.35274	0.9466	1.26002	0.69470	19	9.51878	0.9801	0.98813	1.24251
4	9.35784	0.9486	1.25809	0.72354	20	9.52332	0.9790	0.97588	1.24685
5	9.36389	0.9500	1.25603	0.75045	21	9.52677	0.9779	0.96316	1.25102
<b>h</b> <b>(13.0)</b>					<b>h</b> <b>(16.0)</b>				
6	+9.37018	+0.9505	-1.25382	-0.77566	22	+9.52924	+0.9772	-0.94993	-1.25504
7	9.37603	0.9502	1.25148	0.79935	23	9.53112	0.9771	0.93618	1.25889
8	9.38079	0.9492	1.24900	0.82168	24	9.53279	0.9778	0.92185	1.26258
9	9.38417	0.9478	1.24637	0.84279	25	9.53472	0.9793	0.90691	1.26614
10	9.38603	0.9465	1.24361	0.86278	26	9.53730	0.9814	0.89132	1.26952
11	+9.38653	+0.9456	-1.24070	-0.88177	27	+9.54080	+0.9838	-0.87502	-1.27276
12	9.38620	0.9454	1.23764	0.89983	28	9.54526	0.9861	0.85798	1.27586
13	9.38566	0.9461	1.23444	0.91704	29	9.55050	0.9879	0.84011	1.27881
14	9.38566	0.9477	1.23108	0.93346	30	9.55616	0.9890	0.82136	1.28163
15	9.38682	0.9500	1.22758	0.94915	31	9.56176	0.9893	0.80164	1.28430
16	+9.38945	+0.9526	-1.22392	-0.96416	<b>June</b>				
17	9.39375	0.9552	1.22010	0.97855	1	+9.56694	+0.9887	-0.78086	-1.28683
18	9.39943	0.9573	1.21613	0.99234	2	9.57129	0.9876	0.75891	1.28923
19	9.40598	0.9586	1.21199	1.00557	3	9.57464	0.9863	0.73567	1.29150
20	9.41270	0.9592	1.20769	1.01829	4	9.57701	0.9850	0.71100	1.29363
<b>h</b> <b>(14.0)</b>					<b>h</b> <b>(17.0)</b>				
21	+9.41895	+0.9589	-1.20322	-1.03051	5	9.57860	0.9842	0.68471	1.29563
22	9.42423	0.9580	1.19858	1.04227	6	+9.57981	+0.9841	-0.65661	-1.29750
23	9.42830	0.9568	1.19376	1.05359	7	9.58102	0.9848	0.62643	1.29925
24	9.43101	0.9558	1.18877	1.06449	8	9.58269	0.9862	0.59388	1.30086
25	9.43266	0.9554	1.18360	1.07500	9	9.58514	0.9881	0.55856	1.30235
26	+9.43366	+0.9557	-1.17824	-1.08513	10	9.58858	0.9902	0.51999	1.30371
27	9.43458	0.9569	1.17269	1.09490	11	+9.59301	+0.9920	-0.47753	-1.30495
28	9.43608	0.9589	1.16695	1.10433	12	9.59818	0.9932	0.43034	1.30606
29	9.43854	0.9614	1.16100	1.11343	13	9.60373	0.9937	0.37726	1.30705
30	9.44221	0.9642	1.15485	1.12222	14	9.60923	0.9934	0.31666	1.30792
<b>May</b>					15	9.61430	0.9923	0.24607	1.30866
1	+9.44705	+0.9667	-1.14849	-1.13071	16	+9.61863	+0.9907	-0.16162	-1.30928
2	9.45274	0.9687	1.14191	1.13891	17	9.62208	0.9890	0.05655	1.30979
3	9.45883	0.9698	1.13511	1.14683	18	9.62472	0.9875	0.91754	1.31016
4	9.46476	0.9702	1.12807	1.15449	19	9.62671	0.9865	0.71171	1.31042
5	9.47000	0.9697	1.12080	1.16189	20	9.62841	0.9863	-0.30672	1.31056
<b>h</b> <b>(15.0)</b>					<b>h</b> <b>(18.0)</b>				
6	+9.47411	+0.9688	-1.11328	-1.16904	21	+9.63018	+0.9869	+0.03981	-1.31058
7	9.47696	0.9677	1.10550	1.17595	22	9.63237	0.9882	0.62506	1.31048
8	9.47871	0.9670	1.09746	1.18263	23	9.63523	0.9898	0.96554	1.31026
9	9.47963	0.9668	1.08914	1.18908	24	9.63883	0.9914	0.01931	1.30991
10	9.48024	0.9674	1.08054	1.19531	25	9.64311	0.9927	0.13253	1.30945
11	+9.48105	+0.9688	-1.07165	-1.20133	26	+9.64779	+0.9934	+0.22216	-1.30886
12	9.48263	0.9710	1.06244	1.20715	27	9.65256	0.9932	0.29630	1.30816
13	9.48539	0.9736	1.05291	1.21276	28	9.65706	0.9922	0.35951	1.30733
14	9.48944	0.9762	1.04305	1.21818	29	9.66097	0.9906	0.41457	1.30638
15	9.49465	0.9785	1.03284	1.22341	30	9.66409	0.9885	0.46332	1.30531
16	+9.50067	+0.9801	-1.02226	-1.22845	<b>July</b>				
17	+9.50709	+0.9809	-1.01129	-1.23331	1	+9.66634	+0.9864	+0.50704	-1.30412
					2	+9.66789	+0.9847	+0.54665	-1.30280

# BESSELIAN STAR-NUMBERS, 1904.

293

(CONSTANTS OF STRUVE AND PETERS.)

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.		
July 1	+ 9.66634	+ 0.9864	+ 0.50704	- 1.30412	Aug. 16	+ 9.76493	+ 0.9522	+ 1.18026	- 1.08139		
2	9.66789	0.9847	0.54665	1.30280	17	9.76645	0.9532	1.18550	1.07123		
3	9.66895	0.9836	0.58284	1.30135	18	9.76852	0.9541	1.19055	1.06069		
4	9.66989	0.9833	0.61613	1.29979	19	9.77104	0.9546	1.19543	1.04977		
5	9.67108	0.9838	0.64695	1.29809	20	9.77379	0.9543	1.20013	1.03844		
h (19.0)	6	+ 9.67285	+ 0.9849	+ 0.67561	- 1.29627	h (22.0)	21	+ 9.77650	+ 0.9532	+ 1.20466	- 1.02667
7	9.67532	0.9862	0.70239	1.29432	22	9.77892	0.9512	1.20902	1.01444		
8	9.67857	0.9874	0.72750	1.29224	23	9.78083	0.9486	1.21322	1.00173		
9	9.68254	0.9882	0.75113	1.29002	24	9.78211	0.9458	1.21726	0.98850		
10	9.68693	0.9882	0.77342	1.28768	25	9.78273	0.9432	1.22115	0.97472		
11	+ 9.69137	+ 0.9874	+ 0.79452	- 1.28520	26	+ 9.78285	+ 0.9410	+ 1.22487	- 0.96036		
12	9.69554	0.9859	0.81452	1.28258	27	9.78269	0.9398	1.22845	0.94537		
13	9.69915	0.9837	0.83353	1.27983	28	9.78253	0.9394	1.23188	0.92971		
14	9.70205	0.9812	0.85163	1.27694	29	9.78263	0.9399	1.23515	0.91333		
15	9.70423	0.9789	0.86889	1.27391	30	9.78322	0.9410	1.23829	0.89616		
16	+ 9.70581	+ 0.9770	+ 0.88537	- 1.27074	31	+ 9.78444	+ 0.9423	+ 1.24127	- 0.87816		
17	9.70704	0.9759	0.90114	1.26742	Sept. 1	9.78624	0.9434	1.24412	0.85923		
18	9.70819	0.9755	0.91624	1.26395	2	9.78854	0.9438	1.24683	0.83930		
19	9.70960	0.9760	0.93071	1.26033	3	9.79108	0.9435	1.24940	0.81827		
20	9.71149	0.9769	0.94460	1.25657	4	9.79361	0.9423	1.25183	0.79602		
h (20.0)	21	+ 9.71404	+ 0.9780	+ 0.95795	- 1.25264	h (23.0)	5	+ 9.79586	+ 0.9403	+ 1.25412	- 0.77243
22	9.71714	0.9788	0.97078	1.24856	6	9.79763	0.9378	1.25628	0.74733		
23	9.72066	0.9791	0.98313	1.24431	7	9.79883	0.9353	1.25830	0.72054		
24	9.72437	0.9786	0.99502	1.23991	8	9.79950	0.9330	1.26020	0.69185		
25	9.72792	0.9773	1.00648	1.23534	9	9.79975	0.9314	1.26196	0.66097		
26	+ 9.73105	+ 0.9752	+ 1.01753	- 1.23059	10	+ 9.79981	+ 0.9308	+ 1.26359	- 0.62757		
27	9.73353	0.9726	1.02819	1.22567	11	9.79993	0.9311	1.26509	0.59124		
28	9.73527	0.9699	1.03847	1.22057	12	9.80035	0.9322	1.26646	0.55143		
29	9.73636	0.9674	1.04841	1.21528	13	9.80123	0.9338	1.26770	0.50744		
30	9.73695	0.9655	1.05800	1.20981	14	9.80264	0.9354	1.26881	0.45831		
31	+ 9.73730	+ 0.9644	+ 1.06728	- 1.20414	15	+ 9.80453	+ 0.9367	+ 1.26980	- 0.40275		
Aug. 1	9.73775	0.9642	1.07624	1.19827	16	9.80673	0.9373	1.27066	0.33884		
2	9.73857	0.9647	1.08491	1.19220	17	9.80899	0.9370	1.27139	0.26369		
3	9.74001	0.9656	1.09329	1.18592	18	9.81106	0.9359	1.27199	0.17254		
4	9.74212	0.9666	1.10140	1.17941	19	9.81272	0.9341	1.27247	0.05682		
h (21.0)	5	+ 9.74487	+ 0.9671	+ 1.10924	- 1.17269	h (0.0)	20	+ 9.81384	+ 0.9319	+ 1.27282	- 9.89833
6	9.74805	0.9671	1.11682	1.16573	21	9.81437	0.9298	1.27304	9.64575		
7	9.75139	0.9662	1.12416	1.15853	22	9.81439	0.9281	1.27314	- 8.96897		
8	9.75462	0.9644	1.13126	1.15108	23	9.81408	0.9273	1.27311	+ 9.40885		
9	9.75743	0.9620	1.13813	1.14338	24	9.81369	0.9274	1.27295	9.78242		
10	+ 9.75964	+ 0.9592	+ 1.14477	- 1.13541	25	+ 9.81349	+ 0.9284	+ 1.27267	+ 9.98025		
11	9.76123	0.9564	1.15120	1.12716	26	9.81371	0.9301	1.27226	0.11563		
12	9.76222	0.9539	1.15743	1.11863	27	9.81448	0.9322	1.27172	0.21864		
13	9.76284	0.9522	1.16342	1.10980	28	9.81585	0.9342	1.27105	0.30179		
14	9.76332	0.9514	1.16923	1.10066	29	9.81774	0.9358	1.27025	0.37148		
15	+ 9.76394	+ 0.9515	+ 1.17484	- 1.09119	30	+ 9.81996	+ 0.9365	+ 1.26932	+ 0.43144		
16	+ 9.76493	+ 0.9522	+ 1.18026	- 1.08139	Oct. 1	+ 9.82227	+ 0.9364	+ 1.26826	+ 0.48404		

E = - 0".01 = - 0.001

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.
Oct. 1	+9.82227	+0.9364	+1.26826	+0.48404	Nov. 16	+9.88185	+0.9584	+1.03766	+1.22099
2	9.82439	0.9354	1.26707	0.53086	17	9.88223	0.9588	1.02676	1.22635
3	9.82616	0.9339	1.26575	0.57304	18	9.88263	0.9600	1.01543	1.23152
4	9.82741	0.9321	1.26429	0.61138	h 19	9.88327	0.9619	1.00366	1.23649
5	9.82816	0.9305	1.26270	0.64652	(4.0) 20	9.88434	0.9644	0.99142	1.24128
h (1.0) 6	+9.82850	+0.9296	+1.26097	+0.67892	21	+9.88591	+0.9670	+0.97868	+1.24589
7	9.82861	0.9294	1.25910	0.70897	22	9.88798	0.9693	0.96541	1.25031
8	9.82872	0.9303	1.25709	0.73697	23	9.89044	0.9711	0.95157	1.25456
9	9.82906	0.9320	1.25495	0.76317	24	9.89313	0.9720	0.93714	1.25863
10	9.82981	0.9343	1.25266	0.78777	25	9.89580	0.9720	0.92206	1.26253
11	+9.83108	+0.9368	+1.25023	+0.81094	26	+9.89826	+0.9713	+0.90630	+1.26627
12	9.83283	0.9391	1.24765	0.83282	27	9.90039	0.9701	0.88979	1.26983
13	9.83493	0.9408	1.24492	0.85354	28	9.90207	0.9688	0.87248	1.27324
14	9.83720	0.9416	1.24205	0.87320	29	9.90336	0.9678	0.85430	1.27649
15	9.83938	0.9416	1.23902	0.89189	30	9.90434	0.9673	0.83518	1.27958
16	+9.84126	+0.9407	+1.23584	+0.90970	Dec. 1	+9.90520	+0.9677	+0.81503	+1.28251
17	9.84267	0.9395	1.23250	0.92668	2	9.90615	0.9689	0.79374	1.28529
18	9.84353	0.9381	1.22901	0.94291	3	9.90734	0.9708	0.77121	1.28792
19	9.84391	0.9371	1.22535	0.95844	4	9.90892	0.9730	0.74729	1.29040
20	9.84393	0.9367	1.22153	0.97331	h 5	9.91093	0.9752	0.72182	1.29273
h (2.0) 21	+9.84381	+0.9372	+1.21754	+0.98757	(5.0) 6	+9.91332	+0.9770	+0.69462	+1.29491
22	9.84380	0.9387	1.21337	1.00126	7	9.91593	0.9781	0.66543	1.29694
23	9.84413	0.9409	1.20903	1.01440	8	9.91860	0.9784	0.63400	1.29883
24	9.84497	0.9436	1.20452	1.02704	9	9.92113	0.9779	0.59995	1.30058
25	9.84636	0.9463	1.19982	1.03921	10	9.92333	0.9766	0.56285	1.30218
26	+9.84826	+0.9486	+1.19493	+1.05092	11	+9.92512	+0.9750	+0.52212	+1.30364
27	9.85058	0.9503	1.18985	1.06219	12	9.92643	0.9734	0.47701	1.30496
28	9.85306	0.9510	1.18458	1.07307	13	9.92734	0.9722	0.42652	1.30614
29	9.85546	0.9510	1.17910	1.08355	14	9.92802	0.9716	0.36920	1.30718
30	9.85757	0.9502	1.17341	1.09366	15	9.92864	0.9719	0.30298	1.30808
31	+9.85925	+0.9491	+1.16752	+1.10342	16	+9.92940	+0.9729	+0.22465	+1.30884
Nov. 1	9.86047	0.9480	1.16140	1.11284	17	9.93049	0.9745	0.12883	1.30947
2	9.86127	0.9473	1.15506	1.12194	18	9.93200	0.9764	0.00550	1.30995
3	9.86183	0.9474	1.14848	1.13072	19	9.93396	0.9781	9.83239	1.31030
4	9.86232	0.9484	1.14166	1.13921	20	9.93630	0.9792	9.53988	1.31051
h (3.0) 5	+9.86297	+0.9503	+1.13460	+1.14741	(6.0) 21	+9.93886	+0.9797	+8.12455	+1.31059
6	9.86396	0.9528	1.12728	1.15532	22	9.94147	0.9792	-9.50520	1.31052
7	9.86541	0.9555	1.11969	1.16297	23	9.94393	0.9780	9.81514	1.31032
8	9.86732	0.9582	1.11183	1.17036	24	9.94611	0.9761	9.99408	1.30999
9	9.86964	0.9603	1.10369	1.17749	25	9.94789	0.9740	0.12035	1.30951
10	+9.87217	+0.9617	+1.09525	+1.18439	26	+9.94927	+0.9721	-0.21796	+1.30890
11	9.87469	0.9622	1.08650	1.19104	27	9.95037	0.9706	0.29750	1.30814
12	9.87699	0.9619	1.07743	1.19747	28	9.95127	0.9699	0.36460	1.30725
13	9.87889	0.9610	1.06803	1.20367	29	9.95217	0.9700	0.42259	1.30622
14	9.88032	0.9599	1.05827	1.20965	30	9.95324	0.9708	0.47362	1.30505
15	+9.88127	+0.9589	+1.04816	+1.21542	31	+9.95462	+0.9721	-0.51917	+1.30374
16	+9.88185	+0.9584	+1.03766	+1.22099	32	+9.95636	+0.9735	-0.56027	+1.30228



(CONSTANTS OF STRUVE AND PETERS.)

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	$\tau$	$f$ In Time.	$f'$ In Time.	$G$		$H$		Log $g$ .	Log $h$ .	$i$	Log $i$ .	
	$y$	$s$	$s$	$^{\circ}$	$h\ m$	$^{\circ}$	$h\ m$			"		
Jan.	0	-0.0016	+0.046	+0.055	88 16.1	5 53.1	351 22.9	23 25.5	+0.99665	+1.30967	-1.33	-0.1226
	1	+0.0012	0.061	0.065	87 39.2	5 50.6	350 26.6	23 21.8	0.99691	1.30946	1.47	0.1670
	2	0.0039	0.079	0.075	87 2.0	5 48.1	349 30.1	23 18.0	0.99638	1.30923	1.61	0.2071
	3	0.0066	0.094	0.085	86 27.0	5 45.8	348 33.7	23 14.3	0.99513	1.30898	1.75	0.2437
	4	0.0094	0.107	0.095	85 56.0	5 43.7	347 37.1	23 10.5	0.99338	1.30872	1.89	0.2773
$h$ (7.0)	5	0.0121	+0.118	+0.105	85 30.5	5 42.0	346 40.5	23 6.7	+0.99144	+1.30844	-2.03	-0.3083
	6	0.0149	0.126	0.115	85 11.0	5 40.7	345 43.8	23 2.9	0.98966	1.30812	2.17	0.3372
	7	0.0176	0.132	0.125	84 56.1	5 39.7	344 47.1	22 59.1	0.98835	1.30779	2.31	0.3641
	8	0.0203	0.137	0.135	84 44.2	5 38.9	343 50.2	22 55.3	0.98776	1.30744	2.45	0.3894
	9	0.0231	0.142	0.145	84 32.7	5 38.2	342 53.2	22 51.5	0.98797	1.30708	2.59	0.4131
	10	0.0258	+0.148	+0.155	84 19.2	5 37.3	341 56.2	22 47.7	+0.98888	+1.30669	-2.73	-0.4355
	11	0.0286	0.156	0.164	84 1.5	5 36.1	340 59.0	22 43.9	0.99026	1.30629	2.86	0.4566
	12	0.0313	0.166	0.173	83 38.9	5 34.6	340 1.7	22 40.1	0.99176	1.30587	3.00	0.4766
	13	0.0340	0.179	0.183	83 11.6	5 32.8	339 4.4	22 36.3	0.99304	1.30543	3.13	0.4956
	14	0.0368	0.193	0.193	82 40.2	5 30.7	338 6.9	22 32.5	0.99380	1.30498	3.26	0.5137
	15	0.0395	+0.207	+0.202	82 6.9	5 28.5	337 9.2	22 28.6	+0.99381	+1.30451	-3.40	-0.5309
	16	0.0422	0.221	0.212	81 34.1	5 26.3	336 11.5	22 24.8	0.99302	1.30402	3.53	0.5474
	17	0.0450	0.233	0.221	81 4.5	5 24.3	335 13.6	22 20.9	0.99153	1.30352	3.66	0.5631
	18	0.0477	0.243	0.230	80 39.7	5 22.7	334 15.7	22 17.0	0.98957	1.30302	3.79	0.5781
	19	0.0505	0.250	0.239	80 20.6	5 21.4	333 17.6	22 13.2	0.98745	1.30248	3.91	0.5924
$h$ (8.0)	20	0.0532	+0.254	+0.248	80 7.5	5 20.5	332 19.3	22 9.3	+0.98553	+1.30195	-4.04	-0.6062
	21	0.0559	0.257	0.257	79 58.6	5 19.9	331 21.0	22 5.4	0.98417	1.30139	4.16	0.6194
	22	0.0587	0.260	0.266	79 52.0	5 19.5	330 22.4	22 1.5	0.98358	1.30083	4.29	0.6321
	23	0.0614	0.263	0.275	79 44.8	5 19.0	329 23.8	21 57.6	0.98378	1.30024	4.41	0.6443
	24	0.0641	0.268	0.283	79 34.4	5 18.3	328 25.0	21 53.7	0.98470	1.29966	4.53	0.6561
	25	0.0669	+0.275	+0.292	79 18.8	5 17.3	327 26.1	21 49.7	+0.98606	+1.29905	-4.65	-0.6673
	26	0.0696	0.286	0.300	78 57.0	5 15.8	326 27.0	21 45.8	0.98750	1.29845	4.77	0.6782
	27	0.0724	0.298	0.309	78 29.4	5 14.0	325 27.8	21 41.9	0.98869	1.29783	4.88	0.6887
	28	0.0751	0.312	0.317	77 57.3	5 11.8	324 28.4	21 37.9	0.98932	1.29720	5.00	0.6988
	29	0.0778	0.327	0.325	77 23.1	5 9.5	323 28.9	21 33.9	0.98922	1.29657	5.11	0.7085
	30	0.0806	+0.340	+0.333	76 49.3	5 7.3	322 29.2	21 29.9	+0.98831	+1.29594	-5.22	-0.7178
	31	0.0833	0.352	0.341	76 18.3	5 5.2	321 29.3	21 25.9	0.98680	1.29530	5.33	0.7269
Feb.	1	0.0860	0.361	0.349	75 52.2	5 3.5	320 29.3	21 21.9	0.98484	1.29465	5.44	0.7356
	2	0.0888	0.368	0.357	75 32.1	5 2.1	319 29.2	21 17.9	0.98283	1.29399	5.55	0.7440
	3	0.0915	0.373	0.365	75 17.9	5 1.2	318 28.8	21 13.9	0.98110	1.29334	5.65	0.7521
$h$ (9.0)	4	0.0943	+0.375	+0.372	75 8.4	5 0.6	317 28.3	21 9.9	+0.97998	+1.29267	-5.75	-0.7599
	5	0.0970	0.378	0.380	75 1.3	5 0.1	316 27.7	21 5.8	0.97964	1.29202	5.85	0.7674
	6	0.0997	0.381	0.387	74 54.1	4 59.6	315 26.8	21 1.8	0.98009	1.29136	5.95	0.7747
	7	0.1025	0.386	0.394	74 44.2	4 58.9	314 25.8	20 57.7	0.98119	1.29069	6.05	0.7817
	8	0.1052	0.394	0.402	74 29.8	4 58.0	313 24.7	20 53.6	0.98269	1.29003	6.14	0.7885
	9	0.1080	+0.403	+0.409	74 10.1	4 56.7	312 23.3	20 49.5	+0.98418	+1.28937	-6.24	-0.7951
	10	0.1107	0.414	0.416	73 45.9	4 55.1	311 21.8	20 45.5	0.98532	1.28871	6.33	0.8014
	11	0.1134	0.426	0.423	73 18.2	4 53.2	310 20.1	20 41.3	0.98583	1.28805	6.42	0.8075
	12	0.1162	0.438	0.429	72 49.4	4 51.3	309 18.3	20 37.2	0.98558	1.28741	6.51	0.8133
	13	0.1189	0.448	0.436	72 21.9	4 49.5	308 16.2	20 33.1	0.98452	1.28675	6.59	0.8190
	14	0.1216	+0.456	+0.443	71 58.2	4 47.9	307 14.1	20 28.9	+0.98284	+1.28612	-6.67	-0.8244
	15	0.1244	+0.461	+0.449	71 40.2	4 46.7	306 11.7	20 24.8	+0.98079	+1.28548	-6.76	-0.8297

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	$\tau$	$f$		$f'$		$G$		$H$		Log $g$ .	Log $h$ .	$i$	Log $i$ .	
		In Time.		In Time.		In Arc.	In Time.	In Arc.	In Time.					
		y	s	s		°	h m	°	h m			"		
Feb.	15	0.1244	+0.461	+0.449	71 40.2	4 46.7	306 11.7	20 24.8	+0.98079	+1.28548	-6.76	-0.8297		
	16	0.1271	0.464	0.456	71 28.2	4 45.9	305 9.3	20 20.6	0.97876	1.28486	6.83	0.8347		
	17	0.1299	0.465	0.462	71 22.0	4 45.5	304 6.6	20 16.4	0.97708	1.28424	6.91	0.8395		
	18	0.1326	0.465	0.468	71 19.5	4 45.3	303 3.8	20 12.3	0.97611	1.28363	6.98	0.8442		
	h	19	0.1353	0.465	0.475	71 18.6	4 45.2	302 0.9	20 8.1	0.97596	1.28303	7.06	0.8487	
	(10.0)	20	0.1381	+0.466	+0.481	71 16.5	4 45.1	300 57.8	20 3.9	+0.97663	+1.28245	-7.13	-0.8530	
	21	0.1408	0.471	0.487	71 10.0	4 44.7	299 54.6	19 59.6	0.97797	1.28187	7.20	0.8571		
	22	0.1435	0.477	0.493	70 57.8	4 43.9	298 51.2	19 55.4	0.97965	1.28131	7.26	0.8610		
	23	0.1463	0.486	0.498	70 39.6	4 42.6	297 47.8	19 51.2	0.98130	1.28076	7.32	0.8648		
	24	0.1490	0.497	0.504	70 15.5	4 41.0	296 44.2	19 46.9	0.98258	1.28023	7.39	0.8684		
	25	0.1518	+0.509	+0.510	69 47.8	4 39.2	295 40.5	19 42.7	+0.98324	+1.27970	-7.44	-0.8718		
	26	0.1545	0.521	0.516	69 18.9	4 37.3	294 36.6	19 38.4	0.98312	1.27919	7.50	0.8751		
	27	0.1572	0.531	0.521	68 51.3	4 35.4	293 32.7	19 34.2	0.98230	1.27871	7.56	0.8782		
	28	0.1600	0.539	0.527	68 27.4	4 33.8	292 28.6	19 29.9	0.98091	1.27823	7.61	0.8812		
	29	0.1627	0.544	0.532	68 9.3	4 32.6	291 24.5	19 25.6	0.97927	1.27778	7.66	0.8840		
	Mar.	1	0.1654	+0.546	+0.537	67 57.5	4 31.8	290 20.2	19 21.3	+0.97772	+1.27734	-7.70	-0.8867	
		2	0.1682	0.547	0.543	67 51.4	4 31.4	289 15.9	19 17.1	0.97662	1.27693	7.75	0.8892	
		3	0.1709	0.548	0.548	67 49.3	4 31.3	288 11.5	19 12.8	0.97624	1.27653	7.79	0.8916	
		4	0.1737	0.549	0.553	67 48.6	4 31.2	287 6.9	19 8.5	0.97667	1.27615	7.83	0.8938	
		5	0.1764	0.551	0.558	67 46.6	4 31.1	286 2.3	19 4.2	0.97789	1.27578	7.87	0.8958	
h	6	0.1791	+0.555	+0.563	67 41.3	4 30.8	284 57.6	18 59.8	+0.97968	+1.27544	-7.90	-0.8978		
	(11.0)	7	0.1819	0.562	0.568	67 30.7	4 30.0	283 52.9	18 55.5	0.98166	1.27514	7.94	0.8996	
	8	0.1846	0.571	0.573	67 14.8	4 29.0	282 48.1	18 51.2	0.98352	1.27484	7.97	0.9012		
	9	0.1874	0.581	0.578	66 54.3	4 27.7	281 43.2	18 46.9	0.98492	1.27457	7.99	0.9027		
	10	0.1901	0.591	0.583	66 31.3	4 26.1	280 38.3	18 42.6	0.98560	1.27432	8.02	0.9041		
	11	0.1928	+0.600	+0.588	66 8.2	4 24.5	279 33.4	18 38.2	+0.98548	+1.27410	-8.04	-0.9053		
	12	0.1956	0.606	0.593	65 47.7	4 23.2	278 28.4	18 33.9	0.98464	1.27390	8.06	0.9064		
	13	0.1983	0.610	0.598	65 31.7	4 22.1	277 23.4	18 29.6	0.98331	1.27371	8.08	0.9074		
	14	0.2010	0.613	0.603	65 21.6	4 21.4	276 18.4	18 25.2	0.98180	1.27355	8.10	0.9082		
	15	0.2038	0.612	0.608	65 17.7	4 21.2	275 13.3	18 20.9	0.98048	1.27342	8.11	0.9089		
	16	0.2065	+0.612	+0.613	65 18.8	4 21.2	274 8.3	18 16.6	+0.97970	+1.27332	-8.12	-0.9095		
	17	0.2093	0.609	0.617	65 22.6	4 21.5	273 3.3	18 12.2	0.97971	1.27324	8.13	0.9099		
	18	0.2120	0.609	0.622	65 26.7	4 21.8	271 58.3	18 7.9	0.98059	1.27319	8.13	0.9102		
	19	0.2147	0.610	0.627	65 27.9	4 21.9	270 53.3	18 3.6	0.98225	1.27315	8.14	0.9104		
	20	0.2175	0.615	0.632	65 24.2	4 21.6	269 48.4	17 59.2	0.98444	1.27314	8.14	0.9104		
	h	21	0.2202	+0.623	+0.636	65 14.1	4 20.9	268 43.5	17 54.9	+0.98682	+1.27316	-8.13	-0.9103	
		(12.0)	22	0.2229	0.632	0.641	64 58.0	4 19.9	267 38.6	17 50.6	0.98900	1.27321	8.13	0.9101
		23	0.2257	0.643	0.646	64 36.9	4 18.5	266 33.8	17 46.3	0.99070	1.27327	8.12	0.9098	
		24	0.2284	0.654	0.651	64 13.1	4 16.9	265 29.1	17 41.9	0.99170	1.27336	8.11	0.9093	
		25	0.2312	0.664	0.655	63 49.3	4 15.3	264 24.4	17 37.6	0.99198	1.27348	8.10	0.9087	
26		0.2339	+0.671	+0.660	63 28.0	4 13.9	263 19.8	17 33.3	+0.99161	+1.27361	-8.09	-0.9080		
27		0.2366	0.677	0.665	63 11.3	4 12.8	262 15.3	17 29.0	0.99086	1.27377	8.07	0.9071		
28		0.2394	0.680	0.670	63 0.7	4 12.0	261 10.9	17 24.7	0.99003	1.27395	8.06	0.9061		
29		0.2421	0.681	0.675	62 55.9	4 11.7	260 6.6	17 20.4	0.98950	1.27416	8.04	0.9050		
30		0.2448	0.681	0.680	62 55.8	4 11.7	259 2.4	17 16.2	0.98955	1.27439	8.01	0.9037		
Apr.	31	0.2476	+0.681	+0.685	62 58.5	4 11.9	257 58.4	17 11.9	+0.99037	+1.27464	-7.99	-0.9023		
	1	0.2503	+0.683	+0.689	63 1.1	4 12.1	256 54.4	17 7.6	+0.99197	+1.27492	-7.96	-0.9008		

# INDEPENDENT STAR-NUMBERS, 1904.

297

(CONSTANTS OF STRUVE AND PETERS.)

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.		f	f'	G		H		Log g.	Log h.	i	Log i.	
				In Time.	In Arc.	In Time.	In Arc.					
		s	s	°	h m	°	h m					
Apr.	1	0.2503	+0.683	+0.689	63 1.1	4 12.1	256 54.4	17 7.6	+0.99197	+1.27492	-7.96	-0.9008
	2	0.2531	0.686	0.694	63 0.9	4 12.1	255 50.5	17 3.3	0.99427	1.27520	7.93	0.8991
	3	0.2558	0.692	0.699	62 56.3	4 11.8	254 46.8	16 59.1	0.99692	1.27553	7.89	0.8973
	4	0.2585	0.700	0.704	62 46.4	4 11.1	253 43.2	16 54.9	0.99960	1.27586	7.86	0.8954
	5	0.2613	0.710	0.709	62 31.4	4 10.1	252 39.7	16 50.6	1.00197	1.27622	7.82	0.8933
	6	0.2640	+0.721	+0.715	62 12.7	4 8.8	251 36.4	16 46.4	+1.00376	+1.27659	-7.78	-0.8911
	7	0.2668	0.730	0.720	61 52.5	4 7.5	250 33.2	16 42.2	1.00480	1.27699	7.74	0.8888
	8	0.2695	0.738	0.725	61 33.5	4 6.2	249 30.2	16 38.0	1.00510	1.27740	7.70	0.8863
	9	0.2722	0.744	0.730	61 17.7	4 5.2	248 27.2	16 33.8	1.00480	1.27783	7.65	0.8837
	10	0.2750	0.747	0.736	61 6.9	4 4.5	247 24.5	16 29.6	1.00419	1.27828	7.60	0.8809
	11	0.2777	+0.748	+0.741	61 2.1	4 4.1	246 22.0	16 25.5	+1.00359	+1.27874	-7.55	-0.8780
	12	0.2804	0.748	0.747	61 2.6	4 4.2	245 19.6	16 21.3	1.00336	1.27922	7.50	0.8749
	13	0.2832	0.747	0.753	61 6.8	4 4.5	244 17.2	16 17.1	1.00378	1.27971	7.44	0.8717
	14	0.2859	0.747	0.759	61 12.2	4 4.8	243 15.3	16 13.0	1.00502	1.28022	7.39	0.8684
	15	0.2887	0.749	0.764	61 15.9	4 5.1	242 13.4	16 8.9	1.00706	1.28075	7.33	0.8649
	16	0.2914	+0.753	+0.770	61 15.9	4 5.1	241 11.8	16 4.7	+1.00969	+1.28127	-7.26	-0.8612
	17	0.2941	0.761	0.775	61 10.2	4 4.7	240 10.2	16 0.7	1.01265	1.28183	7.20	0.8574
	18	0.2969	0.771	0.781	60 58.2	4 3.9	239 8.9	15 56.6	1.01559	1.28239	7.13	0.8534
	19	0.2996	0.782	0.787	60 40.7	4 2.7	238 7.9	15 52.5	1.01819	1.28295	7.07	0.8493
	20	0.3023	0.795	0.793	60 19.7	4 1.3	237 6.9	15 48.5	1.02021	1.28354	7.00	0.8450
(14.0)	21	0.3051	+0.806	+0.799	59 57.3	3 59.8	236 6.2	15 44.4	+1.02154	+1.28412	-6.93	-0.8405
	22	0.3078	0.816	0.805	59 36.0	3 58.4	235 5.7	15 40.4	1.02221	1.28471	6.85	0.8359
	23	0.3106	0.824	0.812	59 18.0	3 57.2	234 5.4	15 36.4	1.02242	1.28530	6.78	0.8311
	24	0.3133	0.829	0.818	59 5.1	3 56.3	233 5.3	15 32.4	1.02239	1.28592	6.70	0.8261
	25	0.3160	0.832	0.825	58 57.7	3 55.8	232 5.4	15 28.4	1.02247	1.28654	6.62	0.8209
	26	0.3188	+0.834	+0.831	58 55.2	3 55.7	231 5.7	15 24.4	+1.02297	+1.28715	-6.54	-0.8155
	27	0.3215	0.836	0.838	58 56.2	3 55.7	230 6.2	15 20.4	1.02409	1.28778	6.46	0.8100
	28	0.3242	0.839	0.845	58 58.0	3 55.9	229 7.0	15 16.5	1.02597	1.28840	6.37	0.8043
	29	0.3270	0.843	0.852	58 58.3	3 55.9	228 7.9	15 12.5	1.02850	1.28903	6.28	0.7983
	30	0.3297	0.851	0.859	58 55.1	3 55.7	227 9.0	15 8.6	1.03148	1.28967	6.20	0.7921
May	1	0.3325	+0.860	+0.865	58 47.0	3 55.1	226 10.4	15 4.7	+1.03463	+1.29029	-6.11	-0.7858
	2	0.3352	0.871	0.872	58 33.9	3 54.3	225 11.9	15 0.8	1.03760	1.29092	6.01	0.7792
	3	0.3379	0.884	0.879	58 16.5	3 53.1	224 13.6	14 56.9	1.04013	1.29156	5.92	0.7724
	4	0.3407	0.896	0.886	57 56.6	3 51.8	223 15.5	14 53.0	1.04202	1.29220	5.83	0.7654
	5	0.3434	0.907	0.894	57 36.4	3 50.4	222 17.6	14 49.2	1.04320	1.29283	5.73	0.7581
	6	0.3462	+0.915	+0.901	57 18.3	3 49.2	221 19.9	14 45.3	+1.04374	+1.29348	-5.63	-0.7506
	7	0.3489	0.921	0.909	57 4.2	3 48.3	220 22.4	14 41.5	1.04381	1.29408	5.53	0.7428
	8	0.3516	0.925	0.916	56 55.0	3 47.7	219 25.0	14 37.7	1.04379	1.29470	5.43	0.7348
	9	0.3544	0.927	0.924	56 51.0	3 47.4	218 27.9	14 33.9	1.04392	1.29532	5.33	0.7264
	10	0.3571	0.928	0.932	56 51.0	3 47.4	217 31.0	14 30.1	1.04454	1.29594	5.22	0.7178
	11	0.3598	+0.930	+0.940	56 53.4	3 47.6	216 34.2	14 26.3	+1.04580	+1.29655	-5.12	-0.7089
	12	0.3626	0.934	0.947	56 55.5	3 47.7	215 37.6	14 22.5	1.04780	1.29714	5.01	0.6997
	13	0.3653	0.939	0.955	56 54.8	3 47.7	214 41.1	14 18.7	1.05043	1.29773	4.90	0.6902
	14	0.3681	0.948	0.963	56 49.6	3 47.3	213 44.9	14 15.0	1.05346	1.29832	4.79	0.6803
	15	0.3708	0.960	0.972	56 38.9	3 46.6	212 48.9	14 11.3	1.05661	1.29891	4.68	0.6701
	16	0.3735	+0.973	+0.980	56 22.9	3 45.5	211 53.0	14 7.5	+1.05957	+1.29948	-4.57	-0.6596
	17	0.3763	+0.988	+0.988	56 2.2	3 44.1	210 57.3	14 3.8	+1.06210	+1.30004	-4.45	-0.6486

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		$\tau$	$f$	$f'$	$G$		$H$		Log $\zeta$ .	Log $h$ .	$i$	Log $i$ .
			In Time.	In Time	In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	°	h m	°	h m			"	
May	17	0.3763	+0.988	+0.988	56 2.2	3 44.1	210 57.3	14 3.8	+1.06210	+1.30004	4.45	-0.6486
	18	0.3790	1.002	0.997	55 39.4	3 42.6	210 1.7	14 0.1	1.06402	1.30060	4.34	0.6372
	19	0.3817	1.015	1.006	55 16.4	3 41.1	209 6.3	13 56.4	1.06531	1.30113	4.22	0.6254
	20	0.3845	1.025	1.014	54 55.4	3 39.7	208 11.0	13 52.7	1.06606	1.30166	4.10	0.6132
	21	0.3872	1.033	1.022	54 38.5	3 38.5	207 16.0	13 49.1	1.06647	1.30217	3.99	0.6005
	(16.0) 22	0.3900	+1.039	+1.031	54 26.5	3 37.8	206 21.0	13 45.4	+1.06681	+1.30268	-3.87	-0.5872
	23	0.3927	1.044	1.040	54 19.1	3 37.3	205 26.3	13 41.7	1.06739	1.30319	3.75	0.5735
	24	0.3954	1.048	1.048	54 15.6	3 37.0	204 31.7	13 38.1	1.06844	1.30365	3.62	0.5591
	25	0.3982	1.052	1.057	54 14.0	3 36.9	203 37.1	13 34.5	1.07009	1.30413	3.50	0.5442
	26	0.4009	1.059	1.066	54 12.2	3 36.8	202 42.9	13 30.9	1.07236	1.30459	3.38	0.5286
	27	0.4036	+1.067	+1.075	54 8.0	3 36.5	201 48.6	13 27.2	+1.07514	+1.30502	-3.25	-0.5123
	28	0.4064	1.078	1.084	53 59.8	3 36.0	200 54.6	13 23.6	1.07816	1.30545	3.13	0.4953
	29	0.4091	1.091	1.094	53 47.0	3 35.1	200 0.6	13 20.0	1.08117	1.30585	3.00	0.4774
	30	0.4119	1.106	1.103	53 29.7	3 34.0	199 6.7	13 16.4	1.08387	1.30626	2.88	0.4587
	31	0.4146	1.120	1.112	53 9.4	3 32.6	198 13.0	13 12.9	1.08604	1.30663	2.75	0.4389
June	1	0.4173	+1.134	+1.121	52 47.7	3 31.2	197 19.4	13 9.3	+1.08758	+1.30699	-2.62	-0.4182
	2	0.4201	1.145	1.131	52 26.9	3 29.8	196 25.9	13 5.7	1.08847	1.30734	2.49	0.3962
	3	0.4228	1.154	1.140	52 8.8	3 28.6	195 32.4	13 2.2	1.08887	1.30767	2.36	0.3730
	4	0.4255	1.160	1.150	51 54.8	3 27.7	194 39.1	12 58.6	1.08898	1.30798	2.23	0.3483
	h 5	0.4283	1.164	1.159	51 45.5	3 27.0	193 45.8	12 55.1	1.08909	1.30828	2.10	0.3220
	(17.0) 6	0.4310	+1.168	+1.169	51 40.5	3 26.7	192 52.6	12 51.5	+1.08948	+1.30856	-1.97	-0.2939
	7	0.4338	1.171	1.178	51 38.6	3 26.6	191 59.5	12 48.0	1.09037	1.30884	1.83	0.2637
	8	0.4365	1.175	1.188	51 37.6	3 26.5	191 6.5	12 44.4	1.09188	1.30907	1.70	0.2312
	9	0.4392	1.182	1.198	51 35.5	3 26.4	190 13.5	12 40.9	1.09400	1.30930	1.57	0.1959
	10	0.4420	1.192	1.208	51 30.2	3 26.0	189 20.6	12 37.4	1.09660	1.30951	1.44	0.1573
	11	0.4447	+1.204	+1.217	51 20.0	3 25.3	188 27.8	12 33.9	+1.09943	+1.30971	-1.30	-0.1148
	12	0.4475	1.218	1.227	51 4.9	3 24.3	187 35.0	12 30.3	1.10223	1.30988	1.17	0.0676
	13	0.4502	1.234	1.236	50 45.3	3 23.0	186 42.3	12 26.8	1.10473	1.31003	1.03	0.0146
	14	0.4529	1.250	1.246	50 22.6	3 21.5	185 49.6	12 23.3	1.10673	1.31017	0.90	9.9540
	15	0.4557	1.264	1.256	49 58.6	3 19.9	184 56.9	12 19.8	1.10817	1.31028	0.76	9.8834
	16	0.4584	+1.277	+1.266	49 35.5	3 18.4	184 4.3	12 16.3	+1.10907	+1.31037	-0.63	-9.7989
	17	0.4611	1.287	1.276	49 15.3	3 17.0	183 11.7	12 12.8	1.10952	1.31047	0.49	9.6938
	18	0.4639	1.295	1.285	48 59.1	3 15.9	182 19.1	12 9.3	1.10980	1.31052	0.36	9.5548
	19	0.4666	1.301	1.295	48 47.6	3 15.2	181 26.6	12 5.8	1.11012	1.31056	0.22	9.3490
	20	0.4694	1.306	1.305	48 40.2	3 14.7	180 34.1	12 2.3	1.11075	1.31058	0.09	-8.9440
	h (18.0) 21	0.4721	+1.311	+1.315	48 35.5	3 14.4	179 41.6	11 58.8	+1.11186	+1.31059	+0.05	+8.6771
	22	0.4748	1.318	1.325	48 31.8	3 14.2	178 49.1	11 55.3	1.11352	1.31057	0.18	9.2624
	23	0.4776	1.327	1.335	48 27.0	3 13.8	177 56.6	11 51.8	1.11568	1.31054	0.32	9.5028
	24	0.4803	1.338	1.345	48 19.3	3 13.3	177 4.1	11 48.3	1.11818	1.31048	0.46	9.6566
	25	0.4830	1.351	1.354	48 7.5	3 12.5	176 11.6	11 44.8	1.12079	1.31041	0.59	9.7698
	26	0.4858	+1.365	+1.364	47 51.6	3 11.4	175 19.1	11 41.3	+1.12325	+1.31031	+0.72	+9.8595
	27	0.4885	1.381	1.374	47 32.2	3 10.1	174 26.5	11 37.8	1.12533	1.31020	0.86	9.9330
	28	0.4913	1.395	1.384	47 10.5	3 8.7	173 34.0	11 34.3	1.12686	1.31007	0.99	9.9968
	29	0.4940	1.408	1.394	46 48.5	3 7.2	172 41.4	11 30.8	1.12779	1.30992	1.13	0.0519
	30	0.4967	1.418	1.403	46 28.1	3 5.9	171 48.7	11 27.3	1.12818	1.30976	1.26	0.1006
July	1	0.4995	+1.425	+1.413	46 11.1	3 4.7	170 56.1	11 23.7	+1.12817	+1.30958	+1.39	+0.1443
	2	0.5022	+1.430	+1.423	45 58.1	3 3.9	170 3.3	11 20.2	+1.12803	+1.30937	+1.53	+0.1839

(CONSTANTS OF STRUVE AND PETERS.)

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	$\tau$	$f$	$f'$	$G$		$H$		Log $g$ .	Log $h$ .	$i$	Log $i$ .	
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.					
	$y$	$s$	$s$	$^{\circ}$	$h$ $m$	$^{\circ}$	$h$ $m$					
July	1	0.4995	+1.425	+1.413	46 11.1	3 4.7	170 56.1	11 23.7	+1.12817	+1.30958	+1.39	+0.1443
	2	0.5022	1.430	1.423	45 58.1	3 3.9	170 3.3	11 20.2	1.12803	1.30937	1.53	0.1839
	3	0.5050	1.434	1.433	45 49.7	3 3.3	169 10.5	11 16.7	1.12798	1.30915	1.66	0.2201
	4	0.5077	1.437	1.442	45 44.8	3 3.0	168 17.7	11 13.2	1.12828	1.30892	1.79	0.2534
	5	0.5104	1.441	1.452	45 42.0	3 2.8	167 24.8	11 9.5	1.12910	1.30866	1.92	0.2844
	b											
	(19.0)	6	0.5132	+1.447	+1.462	45 39.2	3 2.6	166 31.8	+1.13051	+1.30839	+2.05	+0.3129
	7	0.5159	1.455	1.471	45 34.7	3 2.3	165 38.8	11 2.6	1.13240	1.30810	2.19	0.3397
	8	0.5186	1.466	1.480	45 26.6	3 1.8	164 45.6	10 59.0	1.13462	1.30779	2.32	0.3648
	9	0.5214	1.479	1.490	45 13.9	3 0.9	163 52.4	10 55.5	1.13697	1.30745	2.45	0.3884
	10	0.5241	1.494	1.500	44 56.7	2 59.8	162 59.1	10 51.9	1.13918	1.30712	2.57	0.4107
	11	0.5269	+1.510	+1.509	44 36.0	2 58.4	162 5.7	10 48.4	+1.14102	+1.30676	+2.70	+0.4318
	12	0.5296	1.524	1.518	44 13.2	2 56.9	161 12.2	10 44.8	1.14236	1.30638	2.83	0.4518
	13	0.5323	1.537	1.527	43 50.3	2 55.3	160 18.6	10 41.2	1.14318	1.30600	2.96	0.4708
	14	0.5351	1.547	1.536	43 29.1	2 53.9	159 24.9	10 37.7	1.14354	1.30559	3.08	0.4889
	15	0.5378	1.555	1.545	43 11.3	2 52.8	158 31.1	10 34.1	1.14358	1.30517	3.21	0.5062
	16	0.5405	+1.561	+1.554	42 57.6	2 51.8	157 37.2	10 30.5	+1.14356	+1.30475	+3.33	+0.5227
	17	0.5433	1.565	1.563	42 48.2	2 51.2	156 43.2	10 26.9	1.14369	1.30430	3.45	0.5384
	18	0.5460	1.569	1.572	42 42.4	2 50.8	155 49.1	10 23.3	1.14416	1.30383	3.58	0.5535
	19	0.5488	1.574	1.581	42 38.6	2 50.6	154 54.8	10 19.7	1.14511	1.30336	3.70	0.5680
	20	0.5515	1.581	1.590	42 34.7	2 50.3	154 0.5	10 16.0	1.14656	1.30288	3.82	0.5819
h												
(20.0)	21	0.5542	+1.591	+1.598	42 29.0	2 49.9	153 5.9	+1.14843	+1.30238	+3.94	+0.5953	
22	0.5570	1.602	1.607	42 20.1	2 49.3	152 11.3	10 8.8	1.15053	1.30187	4.06	0.6081	
23	0.5597	1.615	1.616	42 7.4	2 48.5	151 16.5	10 5.1	1.15259	1.30135	4.17	0.6204	
24	0.5624	1.630	1.625	41 50.9	2 47.4	150 21.6	10 1.4	1.15441	1.30082	4.29	0.6323	
25	0.5652	1.643	1.633	41 31.7	2 46.1	149 26.6	9 57.8	1.15579	1.30027	4.40	0.6438	
26	0.5679	+1.654	+1.641	41 11.1	2 44.7	148 31.3	9 54.1	+1.15665	+1.29973	+4.52	+0.6548	
27	0.5707	1.664	1.649	40 51.3	2 43.5	147 36.0	9 50.4	1.15695	1.29916	4.63	0.6655	
28	0.5734	1.670	1.657	40 33.8	2 42.3	146 40.5	9 46.7	1.15678	1.29859	4.74	0.6758	
29	0.5761	1.674	1.665	40 19.8	2 41.3	145 44.8	9 43.0	1.15637	1.29801	4.85	0.6857	
30	0.5789	1.677	1.673	40 10.2	2 40.7	144 49.0	9 39.3	1.15592	1.29742	4.96	0.6953	
31	0.5816	+1.678	+1.681	40 4.6	2 40.3	143 52.9	9 35.5	+1.15569	+1.29684	+5.06	+0.7046	
Aug.	1	0.5843	1.680	1.689	40 2.0	2 40.1	142 56.7	9 31.8	1.15585	1.29624	5.17	0.7135
	2	0.5871	1.683	1.697	40 0.7	2 40.0	142 0.4	9 28.0	1.15653	1.29563	5.27	0.7222
	3	0.5898	1.689	1.705	39 58.6	2 39.9	141 3.9	9 24.3	1.15776	1.29502	5.38	0.7306
	4	0.5926	1.697	1.713	39 54.1	2 39.6	140 7.1	9 20.5	1.15939	1.29441	5.49	0.7387
	h											
	(21.0)	5	0.5953	+1.708	+1.720	39 45.6	2 39.0	139 10.2	+1.16126	+1.29380	+5.58	+0.7465
	6	0.5980	1.720	1.727	39 33.0	2 38.2	138 13.2	9 12.9	1.16312	1.29316	5.68	0.7541
	7	0.6008	1.733	1.734	39 16.6	2 37.1	137 15.9	9 9.1	1.16474	1.29254	5.77	0.7615
	8	0.6035	1.746	1.742	38 57.3	2 35.8	136 18.4	9 5.2	1.16600	1.29191	5.87	0.7686
	9	0.6063	1.758	1.749	38 37.0	2 34.5	135 20.8	9 1.4	1.16674	1.29128	5.96	0.7754
	10	0.6090	+1.767	+1.756	38 17.6	2 33.2	134 23.0	8 57.5	+1.16699	+1.29066	+6.05	+0.7821
	11	0.6117	1.773	1.763	38 0.7	2 32.0	133 24.9	8 53.7	1.16691	1.29003	6.14	0.7885
	12	0.6145	1.777	1.770	37 47.6	2 31.2	132 26.6	8 49.8	1.16662	1.28941	6.23	0.7947
	13	0.6172	1.780	1.777	37 38.7	2 30.6	131 28.3	8 45.9	1.16638	1.28877	6.32	0.8007
	14	0.6199	1.782	1.784	37 33.7	2 30.2	130 29.7	8 42.0	1.16637	1.28815	6.40	0.8065
	15	0.6227	+1.784	+1.790	37 31.6	2 30.1	129 31.0	8 38.1	+1.16677	+1.28754	+6.49	+0.8121
16	0.6254	+1.788	+1.796	37 30.5	2 30.0	128 32.0	8 34.1	+1.16765	+1.28692	+6.57	+0.8176	

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		$\tau$	$f$		$f'$		$G$		$H$		Log $g$ .	Log $h$ .	$i$	Log $i$ .	
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.							
		$y$	$s$	$s$	$^{\circ}$	$h$ $m$	$^{\circ}$	$h$ $m$							
Aug.	16	0.6254	+1.788	+1.796	37 30.5	2 30.0	128 32.0	8 34.1	+1.16765	+1.28692	+6.57	+0.8176			
	17	0.6282	1.795	1.803	37 28.5	2 29.9	127 32.9	8 30.2	1.16900	1.28631	6.65	0.8228			
	18	0.6309	1.803	1.809	37 24.2	2 29.6	126 33.5	8 26.2	1.17065	1.28570	6.73	0.8278			
	19	0.6336	1.814	1.816	37 16.4	2 29.1	125 34.0	8 22.3	1.17241	1.28510	6.80	0.8327			
	h (22.0)	20	0.6364	1.825	1.822	37 4.9	2 28.3	124 34.3	8 18.3	1.17406	1.28451	6.88	0.8374		
		21	0.6391	+1.837	+1.828	36 50.2	2 27.3	123 34.5	8 14.3	+1.17538	+1.28393	+6.95	+0.8420		
	22	0.6418	1.847	1.834	36 33.5	2 26.2	122 34.4	8 10.3	1.17623	1.28334	7.02	0.8463			
	23	0.6446	1.855	1.840	36 16.6	2 25.1	121 34.2	8 6.3	1.17656	1.28278	7.09	0.8505			
	24	0.6473	1.860	1.846	36 1.2	2 24.1	120 33.8	8 2.3	1.17640	1.28222	7.15	0.8546			
	25	0.6501	1.863	1.852	35 48.8	2 23.3	119 33.1	7 58.2	1.17591	1.28168	7.22	0.8584			
	26	0.6528	+1.864	+1.858	35 40.4	2 22.7	118 32.4	7 54.2	+1.17526	+1.28114	+7.28	+0.8622			
	27	0.6555	1.863	1.864	35 36.3	2 22.4	117 31.4	7 50.1	1.17472	1.28061	7.34	0.8658			
Sept.	28	0.6583	1.862	1.869	35 35.6	2 22.4	116 30.3	7 46.0	1.17449	1.28011	7.40	0.8692			
	29	0.6610	1.863	1.875	35 37.0	2 22.5	115 29.0	7 41.9	1.17474	1.27960	7.46	0.8725			
	30	0.6637	1.865	1.880	35 38.8	2 22.6	114 27.5	7 37.8	1.17549	1.27912	7.51	0.8756			
	31	0.6665	+1.871	+1.886	35 39.1	2 22.6	113 25.9	7 33.7	+1.17673	+1.27865	+7.56	+0.8786			
	h (23.0)	1	0.6692	1.878	1.891	35 36.4	2 22.4	112 24.1	7 29.6	1.17829	1.27819	7.61	0.8814		
		2	0.6720	1.888	1.897	35 29.6	2 22.0	111 22.1	7 25.5	1.17996	1.27776	7.66	0.8841		
	3	0.6747	1.899	1.902	35 18.9	2 21.3	110 20.0	7 21.3	1.18155	1.27734	7.70	0.8867			
	4	0.6774	1.910	1.907	35 4.9	2 20.3	109 17.7	7 17.2	1.18283	1.27694	7.75	0.8891			
	5	0.6802	+1.920	+1.912	34 49.1	2 19.3	108 15.3	7 13.0	+1.18369	+1.27654	+7.79	+0.8914			
	6	0.6829	1.928	1.918	34 33.4	2 18.2	107 12.7	7 8.8	1.18408	1.27618	7.83	0.8936			
	7	0.6857	1.934	1.923	34 19.5	2 17.3	106 10.0	7 4.7	1.18407	1.27582	7.86	0.8956			
	8	0.6884	1.937	1.928	34 8.6	2 16.6	105 7.1	7 0.5	1.18381	1.27549	7.90	0.8975			
h (0.0)	9	0.6911	1.938	1.933	34 2.0	2 16.1	104 4.2	6 56.3	1.18350	1.27519	7.93	0.8993			
	10	0.6939	+1.938	+1.938	33 59.4	2 16.0	103 1.1	6 52.1	+1.18334	+1.27490	+7.96	+0.9009			
	11	0.6966	1.938	1.943	34 0.0	2 16.0	101 57.9	6 47.9	1.18351	1.27463	7.99	0.9024			
	12	0.6993	1.940	1.948	34 2.5	2 16.2	100 54.6	6 43.6	1.18414	1.27438	8.01	0.9038			
	13	0.7021	1.944	1.953	34 5.1	2 16.3	99 51.2	6 39.4	1.18524	1.27415	8.03	0.9050			
	14	0.7048	1.951	1.958	34 5.9	2 16.4	98 47.7	6 35.2	1.18672	1.27394	8.06	0.9061			
	15	0.7076	+1.959	+1.962	34 3.7	2 16.2	97 44.1	6 30.9	+1.18842	+1.27377	+8.07	+0.9071			
	16	0.7103	1.969	1.967	33 57.9	2 15.9	96 40.4	6 26.7	1.19013	1.27361	8.09	0.9080			
	17	0.7130	1.979	1.972	33 48.7	2 15.2	95 36.7	6 22.4	1.19161	1.27348	8.10	0.9087			
	18	0.7158	1.989	1.977	33 37.0	2 14.5	94 32.9	6 18.2	1.19269	1.27336	8.11	0.9093			
	19	0.7185	1.996	1.982	33 24.4	2 13.6	93 29.0	6 13.9	1.19330	1.27327	8.12	0.9098			
	20	0.7212	+2.002	+1.986	33 12.3	2 12.9	92 25.1	6 9.7	+1.19341	+1.27321	+8.13	+0.9101			
Oct.	21	0.7240	2.004	1.991	33 2.7	2 12.2	91 21.1	6 5.4	1.19315	1.27316	8.13	0.9103			
	22	0.7267	2.004	1.996	32 56.6	2 11.8	90 17.1	6 1.1	1.19267	1.27315	8.14	0.9104			
	23	0.7295	2.003	2.001	32 54.6	2 11.6	89 13.0	5 56.9	1.19220	1.27315	8.14	0.9104			
	24	0.7322	2.001	2.006	32 56.4	2 11.8	88 8.9	5 52.6	1.19195	1.27318	8.13	0.9103			
	25	0.7349	+2.000	+2.011	33 0.9	2 12.0	87 4.8	5 48.3	+1.19212	+1.27323	+8.13	+0.9100			
	26	0.7377	2.001	2.015	33 6.4	2 12.4	86 0.7	5 44.0	1.19279	1.27331	8.12	0.9096			
	27	0.7404	2.004	2.020	33 11.2	2 12.7	84 56.6	5 39.8	1.19396	1.27341	8.11	0.9090			
	28	0.7431	2.011	2.024	33 13.5	2 12.9	83 52.4	5 35.5	1.19552	1.27354	8.10	0.9083			
	29	0.7459	2.020	2.029	33 12.2	2 12.8	82 48.3	5 31.2	1.19731	1.27368	8.08	0.9075			
	30	0.7486	+2.030	+2.034	33 6.9	2 12.5	81 44.1	5 26.9	+1.19908	+1.27386	+8.06	+0.9066			
	1	0.7514	+2.041	+2.039	32 58.1	2 11.9	80 40.0	5 22.7	+1.20067	+1.27405	+8.05	+0.9056			

(CONSTANTS OF STRUVE AND PETERS.)

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		$\tau$	$f$	$f'$	$G$		$H$		Log $g$ .	Log $h$ .	$i$	Log $i$ .	
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.					
		y	s	s	o	h m	o	h m			"		
Oct.	1	0.7514	+2.041	+2.039	32 58.1	2 11.9	80 40.0	5 22.7	+1.20067	+1.27405	+8.05	+0.9056	
	2	0.7541	2.051	2.044	32 46.9	2 11.1	79 35.9	5 18.4	1.20188	1.27426	8.02	0.9044	
	3	0.7568	2.059	2.049	32 35.0	2 10.3	78 31.8	5 14.2	1.20268	1.27451	8.00	0.9031	
	4	0.7596	2.065	2.054	32 24.2	2 9.6	77 27.8	5 9.9	1.20307	1.27477	7.97	0.9016	
	h (1.0)	5	0.7623	2.069	2.059	32 15.8	2 9.1	76 23.8	5 5.6	1.20314	1.27506	7.94	0.9000
	6	0.7651	+2.070	+2.064	32 11.1	2 8.7	75 19.8	5 1.3	+1.20311	+1.27537	+7.91	+0.8983	
	7	0.7678	2.071	2.069	32 10.3	2 8.7	74 15.9	4 57.1	1.20313	1.27568	7.88	0.8964	
	8	0.7705	2.071	2.074	32 13.0	2 8.9	73 12.0	4 52.8	1.20348	1.27603	7.84	0.8944	
	9	0.7733	2.073	2.079	32 17.9	2 9.2	72 8.2	4 48.5	1.20421	1.27641	7.80	0.8923	
	10	0.7760	2.076	2.085	32 23.5	2 9.6	71 4.5	4 44.3	1.20541	1.27679	7.76	0.8900	
	11	0.7787	+2.083	+2.090	32 27.9	2 9.9	70 0.9	4 40.1	+1.20703	+1.27720	+7.72	+0.8875	
	12	0.7815	2.091	2.095	32 29.8	2 10.0	68 57.4	4 35.8	1.20893	1.27762	7.67	0.8849	
	13	0.7842	2.101	2.101	32 28.2	2 9.9	67 53.9	4 31.6	1.21091	1.27806	7.62	0.8822	
	14	0.7870	2.112	2.106	32 23.1	2 9.5	66 50.6	4 27.4	1.21277	1.27853	7.57	0.8793	
	15	0.7897	2.123	2.112	32 15.1	2 9.0	65 47.4	4 23.2	1.21431	1.27900	7.52	0.8763	
	16	0.7924	+2.132	+2.117	32 5.5	2 8.4	64 44.2	4 18.9	+1.21542	+1.27950	+7.47	+0.8731	
	17	0.7952	2.139	2.123	31 56.0	2 7.7	63 41.2	4 14.7	1.21608	1.28001	7.41	0.8698	
	18	0.7979	2.143	2.129	31 48.0	2 7.2	62 38.4	4 10.6	1.21632	1.28053	7.35	0.8663	
	19	0.8006	2.145	2.134	31 43.0	2 6.9	61 35.5	4 6.4	1.21630	1.28107	7.29	0.8626	
	h (2.0)	20	0.8034	2.145	2.140	31 41.6	2 6.8	60 32.9	4 2.2	1.21622	1.28163	7.22	0.8588
	21	0.8061	+2.145	+2.146	31 44.0	2 6.9	59 30.4	3 58.0	+1.21628	+1.28219	+7.16	+0.8548	
	22	0.8089	2.144	2.153	31 49.3	2 7.3	58 28.0	3 53.9	1.21668	1.28276	7.09	0.8507	
	23	0.8116	2.146	2.159	31 56.0	2 7.7	57 25.7	3 49.7	1.21754	1.28334	7.02	0.8463	
	24	0.8143	2.150	2.165	32 2.5	2 8.2	56 23.7	3 45.6	1.21890	1.28394	6.95	0.8418	
	25	0.8171	2.157	2.171	32 7.2	2 8.5	55 21.7	3 41.5	1.22066	1.28455	6.87	0.8371	
	26	0.8198	+2.167	+2.178	32 8.7	2 8.6	54 19.8	3 37.3	+1.22268	+1.28517	+6.80	+0.8322	
	27	0.8225	2.178	2.184	32 6.3	2 8.4	53 18.1	3 33.2	1.22480	1.28579	6.72	0.8272	
	28	0.8253	2.191	2.191	32 0.2	2 8.0	52 16.6	3 29.1	1.22681	1.28642	6.64	0.8219	
	29	0.8280	2.203	2.198	31 51.4	2 7.4	51 15.2	3 25.0	1.22851	1.28705	6.55	0.8164	
	30	0.8308	2.213	2.204	31 41.2	2 6.7	50 13.9	3 20.9	1.22983	1.28769	6.47	0.8107	
	31	0.8335	+2.222	+2.211	31 31.2	2 6.1	49 12.8	3 16.9	+1.23073	+1.28834	+6.38	+0.8048	
	Nov.	1	0.8362	2.228	2.218	31 23.1	2 5.5	48 11.8	3 12.8	1.23132	1.28899	6.29	0.7987
2		0.8390	2.232	2.225	31 18.0	2 5.2	47 11.0	3 8.7	1.23173	1.28964	6.20	0.7924	
3		0.8417	2.235	2.232	31 16.4	2 5.1	46 10.3	3 4.7	1.23217	1.29029	6.11	0.7858	
h (3.0)		4	0.8445	2.238	2.240	31 18.2	2 5.2	45 9.7	3 0.7	1.23280	1.29096	6.01	0.7790
5		0.8472	+2.241	+2.247	31 22.4	2 5.5	44 9.3	2 56.6	+1.23377	+1.29162	+5.91	+0.7719	
6		0.8499	2.246	2.254	31 27.6	2 5.8	43 9.1	2 52.6	1.23516	1.29227	5.82	0.7646	
7		0.8527	2.254	2.262	31 32.3	2 6.2	42 9.0	2 48.6	1.23697	1.29292	5.72	0.7570	
8		0.8554	2.264	2.269	31 34.9	2 6.3	41 9.0	2 44.6	1.23908	1.29357	5.61	0.7491	
9		0.8581	2.276	2.277	31 34.3	2 6.3	40 9.3	2 40.6	1.24135	1.29422	5.51	0.7410	
10		0.8609	+2.289	+2.285	31 30.2	2 6.0	39 9.7	2 36.6	+1.24357	+1.29488	+5.40	+0.7325	
11		0.8636	2.303	2.293	31 23.1	2 5.5	38 10.2	2 32.7	1.24554	1.29552	5.29	0.7238	
12		0.8664	2.315	2.301	31 13.9	2 4.9	37 10.8	2 28.7	1.24713	1.29615	5.18	0.7147	
13		0.8691	2.325	2.309	31 4.1	2 4.3	36 11.7	2 24.8	1.24829	1.29679	5.07	0.7053	
14		0.8718	2.333	2.317	30 55.2	2 3.7	35 12.6	2 20.8	1.24904	1.29740	4.96	0.6956	
15		0.8746	+2.338	+2.325	30 48.5	2 3.2	34 13.8	2 16.9	+1.24948	+1.29802	+4.85	+0.6855	
16		0.8773	+2.341	+2.334	30 44.9	2 3.0	33 15.0	2 13.0	+1.24979	+1.29864	+4.73	+0.6750	

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		$\tau$	$f$	$f'$	$G$		$H$		Log $g$ .	Log $h$ .	$i$	Log $i$ .
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	°	h m	°	h m			"	
Nov.	16	0.8773	+2.341	+2.334	30 44.9	2 3.0	33 15.0	2 13.0	+1.24979	+1.29864	+4.73	+0.6750
	17	0.8800	2.343	2.342	30 44.8	2 3.0	32 16.5	2 9.1	1.25017	1.29924	4.61	0.6641
	18	0.8828	2.345	2.351	30 47.5	2 3.2	31 18.0	2 5.2	1.25077	1.29983	4.49	0.6527
	h 19	0.8855	2.349	2.360	30 52.1	2 3.5	30 19.7	2 1.3	1.25176	1.30041	4.37	0.6410
	(4.0) 20	0.8883	2.354	2.368	30 57.0	2 3.8	29 21.5	1 57.4	1.25320	1.30098	4.25	0.6287
	21	0.8910	+2.363	+2.377	31 0.6	2 4.0	28 23.5	1 53.6	+1.25504	+1.30154	+4.13	+0.6160
	22	0.8937	2.374	2.386	31 1.4	2 4.1	27 25.5	1 49.7	1.25717	1.30209	4.01	0.6027
	23	0.8965	2.388	2.395	30 58.9	2 3.9	26 27.7	1 45.9	1.25944	1.30262	3.88	0.5889
	24	0.8992	2.402	2.404	30 52.7	2 3.5	25 30.0	1 42.0	1.26166	1.30314	3.75	0.5744
	25	0.9019	2.417	2.414	30 43.6	2 2.9	24 32.5	1 38.2	1.26365	1.30365	3.63	0.5594
	26	0.9047	+2.431	+2.423	30 32.5	2 2.2	23 35.0	1 34.3	+1.26527	+1.30415	+3.50	+0.5436
	27	0.9074	2.443	2.432	30 21.1	2 1.4	22 37.6	1 30.5	1.26656	1.30461	3.37	0.5271
	28	0.9102	2.452	2.442	30 10.9	2 0.7	21 40.4	1 26.7	1.26748	1.30508	3.23	0.5098
	29	0.9129	2.460	2.451	30 2.9	2 0.2	20 43.2	1 22.9	1.26819	1.30553	3.10	0.4916
	30	0.9156	2.465	2.461	29 58.0	1 59.9	19 46.2	1 19.1	1.26881	1.30596	2.97	0.4725
Dec.	1	0.9184	+2.470	+2.471	29 56.4	1 59.8	18 49.2	1 15.3	+1.26956	+1.30637	+2.83	+0.4523
	2	0.9211	2.476	2.480	29 57.2	1 59.8	17 52.3	1 11.5	1.27056	1.30677	2.70	0.4310
	3	0.9238	2.482	2.490	29 59.4	2 0.0	16 55.5	1 7.7	1.27192	1.30715	2.56	0.4085
	4	0.9266	2.491	2.500	30 1.6	2 0.1	15 58.7	1 3.9	1.27366	1.30751	2.42	0.3846
	h 5	0.9293	2.503	2.510	30 2.3	2 0.2	15 2.1	1 0.1	1.27572	1.30785	2.29	0.3591
	(5.0) 6	0.9321	+2.517	+2.520	30 0.4	2 0.0	14 5.5	0 56.4	+1.27797	+1.30818	+2.15	+0.3319
	7	0.9348	2.532	2.530	29 55.3	1 59.7	13 9.0	0 52.6	1.28021	1.30848	2.01	0.3027
	8	0.9375	2.548	2.540	29 47.1	1 59.1	12 12.5	0 48.8	1.28229	1.30876	1.87	0.2713
	9	0.9403	2.563	2.550	29 36.6	1 58.4	11 16.1	0 45.1	1.28405	1.30903	1.73	0.2372
	10	0.9430	2.575	2.560	29 24.9	1 57.7	10 19.7	0 41.3	1.28542	1.30927	1.59	0.2001
	11	0.9458	+2.586	+2.570	29 13.4	1 56.9	9 23.4	0 37.6	+1.28640	+1.30950	+1.44	+0.1594
	12	0.9485	2.594	2.580	29 3.6	1 56.2	8 27.2	0 33.8	1.28701	1.30970	1.30	0.1143
	13	0.9512	2.599	2.590	28 56.4	1 55.8	7 31.0	0 30.1	1.28742	1.30989	1.16	0.0638
	14	0.9540	2.603	2.600	28 52.3	1 55.5	6 34.8	0 26.3	1.28781	1.31005	1.02	0.0065
	15	0.9567	2.607	2.611	28 51.1	1 55.4	5 38.7	0 22.5	1.28835	1.31019	0.87	9.9403
	16	0.9594	+2.612	+2.621	28 52.0	1 55.5	4 42.6	0 18.9	+1.28917	+1.31031	+0.73	+9.8619
	17	0.9622	2.618	2.632	28 53.8	1 55.6	3 46.5	0 15.1	1.29039	1.31041	0.58	9.7661
	18	0.9649	2.627	2.642	28 54.9	1 55.7	2 50.4	0 11.4	1.29197	1.31048	0.44	9.6428
	19	0.9677	2.639	2.652	28 54.0	1 55.6	1 54.3	0 7.6	1.29387	1.31054	0.29	9.4697
	h 20	0.9704	2.654	2.663	28 50.1	1 55.3	0 58.3	0 3.9	1.29594	1.31057	0.15	9.1772
	(6.0) 21	0.9731	+2.669	+2.673	28 43.0	1 54.9	0 2.2	0 0.1	+1.29801	+1.31059	+0.01	+7.7619
	22	0.9759	2.685	2.683	28 32.8	1 54.2	359 6.2	23 56.4	1.29992	1.31057	-0.14	-9.1425
	23	0.9786	2.701	2.693	28 20.5	1 53.4	358 10.1	23 52.7	1.30153	1.31054	0.28	9.4524
	24	0.9813	2.714	2.704	28 7.3	1 52.5	357 14.0	23 48.9	1.30282	1.31050	0.43	9.6314
	25	0.9841	2.725	2.714	27 54.6	1 51.6	356 17.9	23 45.2	1.30374	1.31042	0.57	9.7577
	26	0.9868	+2.734	+2.725	27 43.6	1 50.9	355 21.8	23 41.5	+1.30439	+1.31032	-0.72	-9.8553
	27	0.9896	2.741	2.735	27 35.3	1 50.4	354 25.6	23 37.7	1.30494	1.31020	0.86	9.9348
	28	0.9923	2.747	2.745	27 30.0	1 50.0	353 29.4	23 34.0	1.30549	1.31006	1.00	0.0019
	29	0.9950	2.752	2.756	27 27.4	1 49.9	352 33.1	23 30.2	1.30622	1.30990	1.15	0.0599
	30	0.9978	2.759	2.766	27 26.5	1 49.8	351 36.8	23 26.5	1.30723	1.30972	1.29	0.1109
	31	1.0005	+2.768	+2.776	27 26.3	1 49.7	350 40.4	23 22.7	+1.30860	+1.30952	-1.43	-0.1565
	32	1.0032	+2.779	+2.786	27 25.2	1 49.7	349 44.0	23 18.9	+1.31026	+1.30929	-1.57	-0.1976



# BESSELIAN AND INDEPENDENT STAR-NUMBERS, 1904. 303

(CONSTANTS OF STRUVE AND PETERS.)

## FOR WASHINGTON SIDEREAL TWELVE HOURS.

Mean Solar Date.	Log <i>A'</i> .	Log <i>B'</i> .	Log <i>C'</i> .	Log <i>D'</i> .	<i>f'</i>	<i>G'</i>	<i>H'</i>	Log <i>g'</i> .	Log <i>h'</i> .	Log <i>i'</i> .
Jan. 0.72	+ 8.2691	+ 0.9929	- 0.4956	+ 1.3044	+ 0.057	87 50	351 10	+ 0.9932	+ 1.3096	- 0.1329
10.70	8.7068	0.9887	0.8024	1.2842	0.157	84 1	341 45	0.9911	1.3066	0.4397
20.67	8.9097	0.9821	0.9712	1.2484	0.250	80 22	332 10	0.9883	1.3018	0.6085
30.64	9.0366	0.9737	1.0818	1.1944	0.335	76 57	322 21	0.9851	1.2958	0.7191
Feb. 9.61	9.1247	0.9647	1.1585	1.1171	0.410	73 50	312 16	0.9822	1.2893	0.7958
19.59	+ 9.1893	+ 0.9560	- 1.2118	+ 1.0063	+ 0.475	71 4	301 56	+ 0.9801	+ 1.2830	- 0.8491
29.56	9.2387	0.9488	1.2469	0.8388	0.533	68 39	291 21	0.9796	1.2778	0.8842
Mar. 10.53	9.2786	0.9439	1.2668	+ 0.5392	0.584	66 34	280 36	0.9813	1.2743	0.9041
20.50	9.3130	0.9421	1.2731	- 8.8143	0.632	64 47	269 48	0.9856	1.2731	0.9104
30.48	9.3447	0.9435	1.2664	0.5525	0.679	63 12	259 4	0.9929	1.2744	0.9037
Apr. 9.45	+ 9.3761	+ 0.9478	- 1.2465	- 0.8418	+ 0.730	61 44	248 30	+ 1.0030	+ 1.2778	- 0.8838
19.42	9.4085	0.9544	1.2123	1.0046	0.787	60 18	238 13	1.0156	1.2829	0.8496
29.40	9.4424	0.9623	1.1616	1.1125	0.850	58 48	228 14	1.0302	1.2890	0.7989
May 9.37	9.4778	0.9705	1.0903	1.1882	0.923	57 11	218 35	1.0460	1.2952	0.7276
19.34	9.5143	0.9782	0.9900	1.2418	1.004	55 26	209 15	1.0626	1.3010	0.6273
29.31	+ 9.5509	+ 0.9845	- 0.8435	- 1.2783	+ 1.092	53 33	200 11	+ 1.0791	+ 1.3058	- 0.4808
June 8.29	9.5867	0.9886	0.6010	1.3005	1.185	51 32	191 18	1.0949	1.3090	0.2383
18.26	9.6209	0.9902	- 9.9554	1.3101	1.283	49 25	182 32	1.1098	1.3105	- 9.5927
28.23	9.6529	0.9892	+ 0.3435	1.3076	1.381	47 15	173 48	1.1233	1.3101	+ 9.9808
July 8.20	9.6821	0.9855	0.7203	1.2929	1.478	45 5	165 1	1.1354	1.3079	0.3576
18.18	+ 9.7082	+ 0.9794	+ 0.9115	- 1.2651	+ 1.569	42 58	156 6	+ 1.1460	+ 1.3040	+ 0.5488
28.15	9.7311	0.9715	1.0350	1.2224	1.654	40 56	147 0	1.1551	1.2988	0.6723
Aug. 7.12	9.7510	0.9625	1.1214	1.1613	1.731	39 4	137 38	1.1630	1.2928	0.7587
17.10	9.7679	0.9531	1.1834	1.0754	1.800	37 23	127 57	1.1699	1.2866	0.8207
27.07	9.7824	0.9445	1.2269	0.9519	1.861	35 55	117 58	1.1761	1.2809	0.8642
Sept. 6.04	+ 9.7948	+ 0.9376	+ 1.2553	- 0.7591	+ 1.915	34 43	107 41	+ 1.1821	+ 1.2764	+ 0.8926
16.01	9.8059	0.9331	1.2703	- 0.3712	1.965	33 45	97 11	1.1883	1.2737	0.9076
25.99	9.8164	0.9317	1.2725	+ 0.0513	2.013	33 2	86 34	1.1951	1.2733	0.9098
Oct. 5.96	9.8268	0.9334	1.2619	0.6616	2.061	32 31	75 55	1.2030	1.2751	0.8992
15.93	9.8378	0.9380	1.2377	0.8997	2.114	32 8	65 20	1.2122	1.2792	0.8750
25.90	+ 9.8499	+ 0.9448	+ 1.1979	+ 1.0440	+ 2.174	31 49	54 57	+ 1.2228	+ 1.2848	+ 0.8352
Nov. 4.88	9.8633	0.9528	1.1390	1.1424	2.242	31 30	44 47	1.2347	1.2912	0.7763
14.85	9.8782	0.9610	1.0548	1.2117	2.320	31 6	34 52	1.2478	1.2976	0.6921
24.82	9.8942	0.9681	0.9323	1.2599	2.407	30 35	25 12	1.2614	1.3033	0.5696
Dec. 4.79	9.9110	0.9732	0.7400	1.2911	2.503	29 55	15 42	1.2753	1.3076	0.3773
14.77	+ 9.9282	+ 0.9757	+ 0.3526	+ 1.3074	+ 2.604	29 5	6 20	+ 1.2889	+ 1.3101	+ 9.9899
24.74	9.9451	0.9751	- 0.0279	1.3099	2.707	28 7	357 1	1.3018	1.3105	- 9.6652
34.71	+ 9.9612	+ 0.9712	- 0.6391	+ 1.2986	+ 2.809	27 2	347 39	+ 1.3136	+ 1.3087	- 0.2764

E = - 0°.001

The above numbers are those used in computing the apparent places of the fixed stars, given on pages 324-399, from the mean places, given on pages 304-311. In order to render exact interpolation possible through intervals of ten days, all short-period terms have been omitted.

MEAN PLACES FOR 1904.0. (January 1 <sup>d</sup> .068, Washington.)						
Name of Star.	Magni- tude.	Right Ascension.			Declination.	Annual Variation.
		h	m	s	°	"
33 Piscium . . . . .	4.7	0	0	25.325	+ 3.0716	- 6 14 40.54 + 20.137
<i>α</i> Andromedæ . . . . .	2.1	0	3	25.404	3.0940	+ 28 33 37.54 19.882
<i>β</i> Cassiopeiæ . . . . .	2.4	0	4	3.054	3.1790	+ 58 37 13.07 19.863
22 Andromedæ . . . . .	4.9	0	5	19.711	3.1061	+ 45 32 16.99 20.037
<i>γ</i> Pegasi ( <i>Algenib</i> ) . . . . .	2.8	0	8	17.476	3.0853	+ 14 38 59.57 20.024
<i>σ</i> Andromedæ . . . . .	4.4	0	13	18.607	+ 3.1249	+ 36 15 10.81 + 19.966
<i>ι</i> Ceti . . . . .	3.6	0	14	32.217	3.0572	- 9 21 21.84 19.977
44 Piscium . . . . .	5.8	0	20	28.872	3.0739	+ 1 24 28.97 19.943
<i>β</i> Hydri . . . . .	2.8	0	20	42.938	3.2161	- 77 47 41.73 20.283
12 Ceti . . . . .	6.0	0	25	8.388	3.0620	- 4 29 15.63 19.926
<i>π</i> Andromedæ . . . . .	4.4	0	31	45.063	+ 3.1950	+ 33 11 27.41 + 19.855
<i>α</i> Cassiopeiæ ( <i>var.</i> ) . . . . .	2.3	0	35	3.275	3.3807	+ 56 0 39.33 19.781
<i>β</i> Ceti . . . . .	2.2	0	38	46.278	3.0131	- 18 30 48.21 19.802
21 Cassiopeiæ . . . . .	5.7	0	39	17.829	3.8877	+ 74 27 48.30 19.726
<i>ο</i> Cassiopeiæ . . . . .	4.7	0	39	22.333	3.3268	+ 47 45 32.68 19.745
<i>δ</i> Piscium . . . . .	4.8	0	43	42.044	+ 3.1092	+ 7 3 45.75 + 19.639
<i>γ</i> Cassiopeiæ . . . . .	2.3	0	50	54.500	3.5900	+ 60 11 49.20 19.549
<i>μ</i> Andromedæ . . . . .	4.0	0	51	25.303	3.3177	+ 37 58 43.43 19.574
43 Cephei (H.) . . . . .	4.6	0	55	31.154	7.4505	+ 85 44 32.59 19.457
<i>ε</i> Piscium . . . . .	4.3	0	57	57.589	3.1103	+ 7 22 24.20 19.435
<i>β</i> Andromedæ . . . . .	2.2	1	4	21.219	+ 3.3476	+ 35 6 42.10 + 19.145
<i>κ</i> Tucanæ . . . . .	4.9	1	12	30.785	2.0416	- 69 23 10.01 19.141
<i>f</i> Piscium . . . . .	5.1	1	12	50.789	3.0918	+ 3 6 32.56 19.017
<i>θ</i> <sup>1</sup> Ceti . . . . .	3.6	1	19	13.474	2.9976	- 8 40 42.94 18.646
38 Cassiopeiæ . . . . .	5.9	1	24	4.498	4.3994	+ 69 46 14.81 18.641
<i>α</i> Ursæ Minoris ( <i>Polaris</i> ) . . . . .	2.2	1	24	15.71*	+ 26.0459	+ 88 47 41.56 + 18.710
<i>η</i> Piscium . . . . .	3.7	1	26	20.668	3.2043	+ 14 51 3.93 18.638
<i>ο</i> Andromedæ . . . . .	4.2	1	31	9.539	3.5060	+ 40 55 31.69 18.105
<i>π</i> Piscium . . . . .	5.5	1	32	0.463	3.1752	+ 11 39 2.17 18.487
<i>α</i> Eridani ( <i>Achernar</i> ) . . . . .	0.4	1	34	8.371	2.2378	- 57 43 27.95 18.338
<i>ν</i> Piscium . . . . .	4.6	1	36	26.066	+ 3.1187	+ 5 0 7.20 + 18.301
<i>ο</i> Piscium . . . . .	4.4	1	40	19.378	3.1637	+ 8 40 29.01 18.201
<i>ζ</i> Ceti . . . . .	3.6	1	46	43.304	2.9598	- 10 48 32.76 17.885
<i>β</i> Arietis . . . . .	2.8	1	49	20.060	3.3063	+ 20 20 20.17 17.698
50 Cassiopeiæ . . . . .	4.1	1	55	13.345	5.0400	+ 71 57 25.19 17.586
<i>γ</i> Andromedæ . . . . .	2.2	1	58	0.160	+ 3.6669	+ 41 52 9.53 + 17.397
<i>α</i> Arietis . . . . .	2.1	2	1	45.552	3.3738	+ 23 0 31.40 17.139
<i>β</i> Trianguli . . . . .	3.1	2	3	49.684	3.5581	+ 34 32 0.31 17.147
<i>ξ</i> <sup>1</sup> Ceti . . . . .	4.5	2	7	54.617	3.1756	+ 8 23 47.45 16.988
<i>γ</i> Trianguli . . . . .	4.3	2	11	36.248	3.5552	+ 33 24 12.34 16.779
67 Ceti . . . . .	5.6	2	12	11.658	+ 2.9901	- 6 51 51.83 + 16.693
<i>δ</i> Hydri . . . . .	4.2	2	20	2.275	1.0552	- 69 5 46.11 16.439
<i>ι</i> Cassiopeiæ . . . . .	4.6	2	21	8.849	4.8883	+ 66 58 16.00 16.374
<i>ξ</i> <sup>2</sup> Ceti . . . . .	4.5	2	23	3.201	+ 3.1851	+ 8 1 48.05 16.260
<i>μ</i> Hydri . . . . .	5.3	2	33	41.428	- 1.3783	- 79 31 41.89 15.668
<i>δ</i> Ceti . . . . .	4.1	2	34	33.661	+ 3.0722	- 0 5 7.12 + 15.662
<i>θ</i> Persei . . . . .	4.2	2	37	38.308	4.0777	+ 48 49 21.87 15.401
<i>γ</i> Ceti . . . . .	3.6	2	38	19.505	+ 3.1049	+ 2 49 53.31 + 15.300

MEAN PLACES FOR 1904.0. (January 1<sup>d</sup>.068, Washington.)

Name of Star.	Magni- tude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	'	"	"
$\sigma$ Arietis . . . . .	5.5	2	46	11.432	+ 3.3064	+ 14	41	11.99	+ 14.969
47 Cephei (H.) . . . . .	5.7	2	53	17.853	7.7973	+ 79	2	23.48	14.593
$\epsilon$ Arietis . . . . .	4.6	2	53	43.216	3.4234	+ 20	57	23.84	14.548
$\alpha$ Ceti . . . . .	2.6	2	57	15.597	3.1321	+ 3	42	48.13	14.265
$\beta$ Persei ( <i>Algol</i> ) ( <i>var.</i> ) . . . . .	2.3	3	1	55.130	3.8895	+ 40	35	10.07	14.054
48 Cephei (H.) . . . . .	5.5	3	8	7.063	+ 7.4613	+ 77	22	57.18	+ 13.609
$\zeta$ Arietis . . . . .	4.8	3	9	22.873	3.4417	+ 20	41	20.06	13.501
$\alpha$ Persei . . . . .	1.9	3	17	27.866	+ 4.2637	+ 49	31	11.50	13.027
$\iota$ Hydri . . . . .	5.7	3	18	20.343	- 1.5745	- 77	44	21.29	13.037
$f$ Tauri . . . . .	4.3	3	25	34.294	+ 3.3076	+ 12	36	28.79	12.511
$\epsilon$ Eridani . . . . .	3.7	3	28	24.417	+ 2.8246	- 9	46	58.35	+ 12.339
$\delta$ Persei . . . . .	3.1	3	36	5.149	4.2554	+ 47	28	51.47	11.741
$\gamma$ Camelopardalis . . . . .	4.6	3	40	12.862	6.2665	+ 71	2	12.64	11.426
$\eta$ Tauri . . . . .	3.1	3	41	46.552	3.5597	+ 23	48	30.91	11.321
$\zeta$ Persei . . . . .	3.0	3	48	5.697	+ 3.7631	+ 31	35	55.96	10.897
$\gamma$ Hydri . . . . .	3.3	3	48	43.125	- 0.9770	- 74	31	59.81	+ 10.982
$\epsilon$ Persei . . . . .	3.0	3	51	24.553	+ 4.0160	+ 39	43	58.33	10.640
$\gamma$ Eridani . . . . .	3.0	3	53	33.012	2.7979	- 13	46	52.79	10.397
A <sup>1</sup> Tauri . . . . .	4.6	3	59	1.085	3.5416	+ 21	49	11.82	10.040
$c$ Persei . . . . .	4.3	4	1	41.354	4.3431	+ 47	27	23.64	9.863
$\nu$ Eridani . . . . .	4.2	4	7	10.737	+ 2.9267	- 7	5	15.22	+ 9.560
$\gamma$ Tauri . . . . .	3.8	4	14	19.733	3.4103	+ 15	23	46.09	8.893
$\epsilon$ Tauri . . . . .	3.6	4	23	0.584	+ 3.4994	+ 18	58	4.24	8.199
$\delta$ Mensæ . . . . .	5.6	4	24	27.063	- 4.1783	- 80	26	20.74	8.189
$m$ Persei . . . . .	6.0	4	26	39.475	+ 4.2123	+ 42	51	33.19	7.945
$\alpha$ Tauri ( <i>Aldebaran</i> ) . . . . .	1.0	4	30	24.645	+ 3.4388	+ 16	18	59.86	+ 7.449
$\tau$ Tauri . . . . .	4.5	4	36	28.917	3.5973	+ 22	46	23.13	7.125
$\alpha$ Camelopardalis . . . . .	4.4	4	44	30.151	5.9407	+ 66	10	48.60	6.490
$i$ Tauri . . . . .	5.2	4	45	45.417	3.5065	+ 18	40	36.52	6.346
$\iota$ Aurigæ . . . . .	2.8	4	50	44.414	3.9023	+ 33	0	52.07	5.945
$\zeta$ Aurigæ . . . . .	3.9	4	55	45.948	+ 4.1876	+ 40	56	10.13	+ 5.523
11 Orionis . . . . .	4.7	4	59	4.962	3.4258	+ 15	16	14.72	5.230
$\beta$ Eridani . . . . .	2.9	5	3	7.810	2.9487	- 5	12	36.71	4.849
$\alpha$ Aurigæ ( <i>Capella</i> ) . . . . .	0.1	5	9	35.742	4.4270	+ 45	54	2.92	3.945
$\beta$ Orionis ( <i>Rigel</i> ) . . . . .	0.3	5	9	55.424	2.8818	- 8	18	43.99	4.345
$\tau$ Orionis . . . . .	3.8	5	12	56.691	+ 2.9121	- 6	56	52.19	+ 4.082
$\beta$ Tauri . . . . .	1.8	5	20	13.353	3.7904	+ 28	31	36.27	3.285
$\chi$ Aurigæ . . . . .	5.0	5	26	28.724	3.9031	+ 32	7	16.99	2.909
Groombridge 966 . . . . .	6.4	5	26	52.990	8.0013	+ 74	58	51.66	2.904
$\delta$ Orionis ( <i>var.</i> ) . . . . .	2.3	5	27	6.104	3.0638	- 0	22	11.56	2.865
$\alpha$ Leporis . . . . .	2.7	5	28	29.764	+ 2.6454	- 17	53	26.63	+ 2.747
Groombridge 944 . . . . .	6.4	5	31	9.144	18.7110	+ 85	8	59.87	2.513
$\epsilon$ Orionis . . . . .	1.8	5	31	20.511	3.0432	- 1	15	46.35	2.501
$\alpha$ Columbæ . . . . .	2.7	5	36	10.369	2.1722	- 34	7	30.28	2.042
$\kappa$ Orionis . . . . .	2.3	5	43	12.204	2.8446	- 9	42	12.35	1.465
$\delta$ Doradus . . . . .	4.4	5	44	35.989	+ 0.1012	- 65	46	17.48	+ 1.345
$\nu$ Aurigæ . . . . .	4.1	5	44	50.156	4.1568	+ 39	7	14.79	1.339
$\alpha$ Orionis ( <i>var.</i> ) . . . . .	0.9	5	49	58.462	+ 3.2476	+ 7	23	22.20	+ 0.886

MEAN PLACES FOR 1904.0. (January 1<sup>d</sup>.068, Washington.)

Name of Star.	Magni- tude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	'	"	"
$\beta$ Aurigæ . . . . .	2.0	5	52	29.242	+ 4.4014	+ 44	56	17.30	+ 0.651
$\theta$ Aurigæ . . . . .	2.9	5	53	10.495	4.0913	+ 37	12	22.48	+ 0.506
$\nu$ Orionis . . . . .	4.5	6	2	5.468	3.4263	+ 14	46	48.92	- 0.208
22 Camelopardalis (H.) . . . . .	4.7	6	8	16.179	6.6197	+ 69	21	15.16	0.837
$\eta$ Geminorum . . . . .	3.5	6	9	5.004	3.6227	+ 22	32	5.90	0.811
$\mu$ Geminorum . . . . .	3.2	6	17	9.186	+ 3.6308	+ 22	33	47.72	- 1.613
$\psi^1$ Aurigæ . . . . .	5.1	6	17	30.398	4.6265	+ 49	20	14.52	1.533
$\alpha$ Argûs ( <i>Canopus</i> ) . . . . .	-0.8	6	21	49.251	1.3318	- 52	38	35.22	1.897
$\nu$ Geminorum . . . . .	4.2	6	23	15.786	3.5630	+ 20	16	23.80	2.047
$\gamma$ Geminorum . . . . .	2.0	6	32	9.991	3.4672	+ 16	28	53.57	2.852
$\epsilon$ Geminorum . . . . .	3.2	6	38	1.580	+ 3.6933	+ 25	13	35.68	- 3.329
$\psi^5$ Aurigæ . . . . .	5.4	6	39	49.327	4.3309	+ 43	40	24.20	3.306
† $\alpha$ Canis Majoris ( <i>Sirius</i> ) . . . . .	-1.4	6	40	55.068	2.6435	- 16	35	3.10	4.767
$\theta$ Geminorum . . . . .	3.7	6	46	27.785	+ 3.9590	+ 34	4	38.62	4.087
$\zeta$ Mensæ . . . . .	5.6	6	48	2.699	- 4.9250	- 80	42	45.59	4.090
$\epsilon$ Canis Majoris . . . . .	1.5	6	54	51.171	+ 2.3573	- 28	50	28.07	- 4.749
51 Cephei (H.) . . . . .	5.3	6	55	42.37*	29.5414	+ 87	12	1.42	4.860
$\zeta$ Geminorum ( <i>var.</i> ) . . . . .	4.0	6	58	24.956	3.5612	+ 20	42	41.27	5.062
$\delta$ Canis Majoris . . . . .	1.9	7	4	29.236	2.4380	- 26	14	25.77	5.563
63 Aurigæ . . . . .	5.2	7	5	3.255	+ 4.1344	+ 39	28	39.20	5.617
$\gamma^2$ Volantis ( <i>var.</i> ) . . . . .	3.9	7	9	33.776	- 0.4976	- 70	20	34.87	- 5.914
25 Camelopardalis (H.) . . . . .	5.3	7	10	55.251	+ 12.8840	+ 82	35	51.60	6.151
$\delta$ Geminorum . . . . .	3.5	7	14	23.457	3.5873	+ 22	9	34.07	6.408
Piazzii vii, 67 . . . . .	5.7	7	20	53.887	6.2844	+ 68	39	44.29	6.975
$\beta$ Canis Minoris . . . . .	3.1	7	21	56.726	3.2559	+ 8	28	59.11	7.063
$\alpha^2$ Geminorum ( <i>Castor</i> ) . . . . .	1.9	7	28	28.563	+ 3.8347	+ 32	5	58.69	- 7.630
† $\alpha$ Canis Min. ( <i>Procyon</i> ) . . . . .	0.5	7	34	16.625	3.1427	+ 5	28	16.41	9.053
$\beta$ Geminorum ( <i>Pollux</i> ) . . . . .	1.2	7	39	26.577	3.6772	+ 28	15	30.31	8.483
$\varphi$ Geminorum . . . . .	5.0	7	47	37.431	3.6781	+ 27	0	52.82	9.098
26 Lyncis . . . . .	5.8	7	47	43.557	4.3849	+ 47	48	49.97	9.085
Groombridge 1374 . . . . .	5.6	7	48	43.008	+ 7.2645	+ 74	10	29.80	9.194
$\omega^1$ Cancri . . . . .	6.0	7	55	7.426	3.6354	+ 25	39	21.35	9.656
3 Ursæ Majoris (H.) . . . . .	5.5	8	3	16.016	6.0252	+ 68	45	25.94	10.265
15 Argûs ( $\rho$ ) . . . . .	3.1	8	3	27.327	2.5545	- 24	1	37.91	10.232
$\zeta^1$ Cancri . . . . .	4.8	8	6	42.457	3.4457	+ 17	56	15.62	10.655
$\beta$ Cancri . . . . .	3.8	8	11	18.587	+ 3.2565	+ 9	28	54.22	- 10.920
30 Monocerotis . . . . .	3.9	8	20	51.871	+ 3.0000	- 3	35	34.59	11.580
$\theta$ Chamæleontis . . . . .	4.6	8	23	31.737	- 1.7289	- 77	10	29.87	11.733
$\eta$ Cancri . . . . .	5.4	8	27	9.534	+ 3.4758	+ 20	46	3.25	12.061
$\sigma$ Hydræ . . . . .	4.5	8	33	44.443	3.1389	+ 3	40	43.66	12.474
$\gamma$ Cancri . . . . .	4.9	8	37	43.947	+ 3.4784	+ 21	48	50.59	- 12.776
$\epsilon$ Hydræ . . . . .	3.5	8	41	41.600	3.1805	+ 6	46	16.86	13.047
$\alpha^2$ Cancri ( <i>mean</i> ) . . . . .	5.5	8	48	23.394	3.6703	+ 30	56	35.82	13.460
$\iota$ Ursæ Majoris . . . . .	3.3	8	52	38.337	4.1276	+ 48	25	8.10	13.962
$\alpha^2$ Ursæ Majoris . . . . .	5.0	9	1	57.377	5.3368	+ 67	31	28.69	14.362
$\kappa$ Cancri . . . . .	5.1	9	2	32.934	+ 3.2537	+ 11	3	17.24	14.345
$\theta$ Hydræ . . . . .	4.0	9	9	22.250	3.1243	+ 2	43	10.52	15.055
$\beta$ Argûs . . . . .	2.0	9	12	8.934	+ 0.6739	- 69	19	18.22	14.813

† Periodic corrections given in the Appendix are still to be applied to the positions of Sirius and Procyon.

MEAN PLACES FOR 1904.0. (January 1<sup>d</sup>.068, Washington.)

Name of Star.	Magni- tude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	'	"	"
$\epsilon$ Argûs . . . . .	2.6	9	14	31.136	+ 1.6043	- 58	52	19.95	- 15.038
$\alpha$ Lyncis . . . . .	3.3	9	15	12.564	3.6664	+ 34	47	55.62	15.072
$\alpha$ Hydræ . . . . .	2.1	9	22	52.217	2.9488	- 8	14	31.92	15.484
$\gamma$ Draconis (H.) . . . .	4.5	9	23	26.859	8.8854	+ 81	45	4.67	15.576
$\delta$ Ursæ Majoris . . . .	4.8	9	26	0.397	5.3786	+ 70	15	9.49	15.618
$\theta$ Ursæ Majoris . . . .	3.2	9	26	26.488	+ 4.0364	+ 52	6	54.73	- 16.257
$\iota$ Leonis Minoris . . . .	4.7	9	28	20.728	3.6884	+ 36	49	26.70	15.836
$\nu$ Leonis . . . . .	3.8	9	36	1.700	+ 3.2060	+ 10	19	45.76	16.253
$\zeta$ Chamæleontis . . . .	5.2	9	36	43.638	- 1.6182	- 80	30	35.88	16.237
$\epsilon$ Leonis . . . . .	3.2	9	40	24.240	+ 3.4129	+ 24	12	59.28	16.463
$\mu$ Leonis . . . . .	4.0	9	47	18.322	+ 3.4192	+ 26	27	33.58	- 16.834
$\iota$ Leonis Minoris . . . .	5.2	9	51	48.472	3.6889	+ 41	30	47.06	17.014
$\pi$ Leonis . . . . .	5.0	9	55	8.476	3.1731	+ 8	30	18.11	17.171
$\alpha$ Leonis ( <i>Regulus</i> ) . . .	1.3	10	3	15.639	3.1993	+ 12	26	11.72	17.503
$\beta$ Ursæ Majoris . . . .	5.7	10	11	4.258	4.4058	+ 65	35	14.97	17.837
$\lambda$ Ursæ Majoris . . . .	3.6	10	11	18.671	+ 3.6352	+ 43	23	38.50	- 17.873
$\gamma$ Leonis . . . . .	2.5	10	14	40.879	3.3132	+ 20	19	38.42	18.118
$\mu$ Hydræ . . . . .	4.1	10	21	26.832	2.9001	- 16	20	45.62	18.301
$\beta$ Leonis Minoris . . . .	4.3	10	22	20.132	3.4824	+ 37	11	57.34	18.366
$\alpha$ Antliæ . . . . .	4.5	10	22	45.469	2.7413	- 30	34	44.62	18.292
$\gamma$ Draconis (H.) . . . .	5.0	10	26	57.193	+ 5.2142	+ 76	12	27.83	- 18.426
$\rho$ Leonis . . . . .	4.0	10	27	45.453	3.1625	+ 9	48	2.90	18.448
$\delta$ Leonis Minoris . . . .	5.1	10	38	11.894	3.2689	+ 23	41	28.11	18.774
$\gamma$ Argûs ( <i>var.</i> ) . . . .	1-6	10	41	20.077	2.3184	- 59	10	46.97	18.886
$\lambda$ Leonis . . . . .	5.3	10	44	12.748	3.1573	+ 11	3	11.70	18.993
$\delta$ Chamæleontis . . . .	4.7	10	44	53.234	+ 0.6051	- 80	2	1.84	- 18.983
$\delta$ Leonis Minoris . . . .	3.9	10	47	56.732	3.3663	+ 34	43	57.33	19.347
Groombridge 1706 . . . .	6.3	10	52	17.516	4.9222	+ 78	17	4.48	19.213
$\alpha$ Ursæ Majoris . . . .	2.0	10	57	48.614	+ 3.7374	+ 62	16	9.81	19.384
$\gamma$ Octantis . . . . .	6.1	10	59	59.71*	- 0.3189	- 84	4	38.84	19.368
$\rho$ Leonis . . . . .	6.2	11	2	0.447	+ 3.0616	+ 2	28	36.70	- 19.488
$\psi$ Ursæ Majoris . . . .	3.2	11	4	16.210	3.3891	+ 45	1	10.26	19.489
$\delta$ Leonis . . . . .	2.7	11	9	0.278	3.1967	+ 21	2	59.10	19.693
$\nu$ Ursæ Majoris . . . .	3.7	11	13	17.761	3.2504	+ 33	37	5.69	19.605
$\delta$ Crateris . . . . .	3.9	11	14	32.413	2.9967	- 14	15	32.17	19.458
$\tau$ Leonis . . . . .	5.1	11	23	0.040	+ 3.0860	+ 3	23	6.16	- 19.802
$\lambda$ Draconis . . . . .	4.0	11	25	42.813	3.6083	+ 69	51	39.57	19.843
$\xi$ Hydræ . . . . .	3.8	11	28	16.713	2.9444	- 31	19	35.15	19.909
$\nu$ Leonis . . . . .	4.4	11	32	2.011	3.0715	- 0	17	37.14	19.858
$\chi$ Ursæ Majoris . . . .	3.9	11	40	59.088	3.1839	+ 48	18	42.21	19.958
$\beta$ Leonis . . . . .	2.2	11	44	9.837	+ 3.0632	+ 15	6	31.46	- 20.117
$\gamma$ Ursæ Majoris . . . .	2.4	11	48	47.118	3.1747	+ 54	13	42.72	20.018
$\pi$ Virginis . . . . .	4.6	11	55	57.214	3.0745	+ 7	8	58.70	20.075
$\nu$ Virginis . . . . .	4.3	12	0	19.165	3.0573	+ 9	15	58.12	20.014
$\epsilon$ Corvi . . . . .	3.2	12	5	11.159	3.0796	- 22	5	9.11	20.039
$\delta$ Draconis (H.) . . . .	5.1	12	7	42.561	+ 2.8608	+ 78	8	58.90	- 20.016
$\gamma$ Corvi . . . . .	2.7	12	10	52.050	3.0804	- 17	0	31.76	20.007
$\delta$ Canum Venaticorum . .	6.0	12	11	19.134	+ 3.0185	+ 41	11	40.13	20.068

MEAN PLACES FOR 1904.0. (January 1<sup>d</sup>.068, Washington.)

Name of Star.	Magni- tude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	'	"	"
$\beta$ Chamæleontis . . . . .	4.5	12	12	42.116	+ 3.4269	-- 78	46	44.98	-- 19.999
6 Ursæ Minoris (B.) . . . . .	6.2	12	14	24.158	0.2788	+ 88	13	55.41	19.948
$\eta$ Virginis . . . . .	4.0	12	14	59.668	3.0690	-- 0	7	59.94	20.031
$\alpha^1$ Crucis . . . . .	0.9	12	21	15.165	3.3044	-- 62	34	1.47	20.000
$\delta^2$ Corvi . . . . .	3.1	12	24	53.757	3.0999	-- 15	58	51.53	20.077
$\beta$ Canum Venaticorum . . . . .	4.4	12	29	11.194	+ 2.8585	+ 41	52	44.63	-- 19.605
$\beta$ Corvi . . . . .	2.8	12	29	20.524	3.1436	-- 22	51	57.19	19.944
$\kappa$ Draconis . . . . .	3.8	12	29	23.385	2.5834	+ 70	19	2.54	19.872
$\gamma$ Virginis ( <i>mean</i> ) . . . . .	2.9	12	36	47.775	3.0393	-- 0	55	22.48	19.785
31 Comæ Berenices . . . . .	5.1	12	47	1.389	2.9250	+ 28	3	46.89	19.650
32 <sup>2</sup> Camelopardalis (H.) . . . . .	5.2	12	48	24.831	+ 0.4166	+ 83	56	5.05	-- 19.584
$\alpha$ Canum Venaticorum . . . . .	3.2	12	51	32.310	2.8122	+ 38	50	12.31	19.493
$\delta$ Muscæ . . . . .	3.8	12	55	39.396	4.0568	-- 71	1	51.93	19.490
$\epsilon$ Virginis . . . . .	3.1	12	57	23.889	2.9865	+ 11	28	30.15	19.406
$\theta$ Virginis . . . . .	4.6	13	4	58.698	3.1024	-- 5	1	35.66	19.286
20 Canum Venaticorum . . . . .	4.7	13	13	14.397	+ 2.6970	+ 41	4	40.71	-- 19.016
$\alpha$ Virginis ( <i>Spica</i> ) . . . . .	1.1	13	20	8.055	3.1558	-- 10	39	37.08	18.866
$\kappa$ Octantis . . . . .	5.4	13	25	17.52*	8.9007	-- 85	17	39.57	18.697
$\zeta$ Virginis . . . . .	3.6	13	29	48.030	3.0538	-- 0	6	18.58	18.488
B. A. C. 4536 . . . . .	5.0	13	30	30.705	2.6827	+ 37	40	27.01	18.507
$m$ Virginis . . . . .	5.4	13	36	34.319	+ 3.1440	-- 8	13	7.34	-- 18.261
$\eta$ Ursæ Majoris . . . . .	1.9	13	43	45.552	2.3690	+ 49	47	32.08	18.049
$\eta$ Bootis . . . . .	2.8	13	50	6.830	2.8568	+ 18	52	43.62	18.140
$\theta$ Apodis ( <i>var.</i> ) . . . . .	5.0	13	55	57.256	5.7069	-- 76	20	0.84	17.564
$\beta$ Centauri . . . . .	0.7	13	57	2.607	4.1964	-- 59	54	36.00	17.522
$\pi$ Hydræ . . . . .	3.6	14	0	54.135	+ 3.4069	-- 26	13	12.32	-- 17.467
$\alpha$ Draconis . . . . .	3.7	14	1	47.439	1.6239	+ 64	50	4.43	17.271
$d$ Bootis . . . . .	4.8	14	6	1.368	2.7401	+ 25	32	46.32	17.169
$\kappa$ Virginis . . . . .	4.2	14	7	46.404	+ 3.1955	-- 9	49	37.37	16.879
4 Ursæ Minoris . . . . .	4.9	14	9	12.799	-- 0.2980	+ 77	59	54.83	16.918
$\alpha$ Bootis ( <i>Arcturus</i> ) . . . . .	0.2	14	11	16.941	+ 2.7352	+ 19	40	55.25	-- 18.849
$\delta$ Octantis . . . . .	5.0	14	11	28.210	9.1300	-- 83	13	42.57	16.851
$\lambda$ Bootis . . . . .	4.3	14	12	44.122	2.2837	+ 46	31	44.25	16.626
$\lambda$ Virginis . . . . .	4.7	14	13	54.790	3.2392	-- 12	55	45.83	16.700
$\theta$ Bootis . . . . .	4.1	14	21	55.766	2.0434	+ 52	17	39.52	16.729
$\rho$ Bootis . . . . .	3.6	14	27	41.583	+ 2.5867	+ 30	47	33.39	-- 15.912
5 Ursæ Minoris . . . . .	4.5	14	27	43.163	-- 0.1755	+ 76	7	22.19	16.003
$\alpha^2$ Centauri . . . . .	0.2	14	33	4.384	+ 4.0466	-- 60	26	21.84	15.012
33 Bootis . . . . .	5.3	14	35	15.924	2.2344	+ 44	49	6.97	15.663
$\alpha$ Apodis . . . . .	4.1	14	35	54.390	7.2468	-- 78	38	15.14	15.608
$\epsilon$ Bootis . . . . .	2.6	14	40	47.671	+ 2.6203	+ 27	28	43.29	-- 15.302
$\alpha^2$ Libræ . . . . .	2.9	14	45	33.938	+ 3.3121	-- 15	38	34.98	15.116
$\beta$ Ursæ Minoris . . . . .	2.2	14	50	58.779	-- 0.2156	+ 74	32	52.17	14.719
$\beta$ Bootis . . . . .	3.7	14	58	19.802	+ 2.2600	+ 40	46	8.38	14.318
$\gamma$ Scorpii . . . . .	3.4	14	58	26.961	3.5025	-- 24	54	17.36	14.318
$\delta$ Bootis . . . . .	3.5	15	11	37.956	+ 2.4192	+ 33	40	21.68	-- 13.563
$\beta$ Libræ . . . . .	2.9	15	11	50.377	3.2235	-- 9	1	44.20	13.448
$\mu^1$ Bootis . . . . .	4.5	15	20	51.834	+ 2.2662	+ 37	42	48.99	-- 12.746

MEAN PLACES FOR 1904.0. (January 1<sup>d</sup>.068, Washington.)

Name of Star.	Magni- tude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s		°	'	"	
$\gamma^2$ Ursæ Minoris	3.2	15	20	52.607	0.1238	+ 72	10	32.08	- 12.814
$\rho$ Octantis	5.7	15	21	4.05*	+ 13.1808	- 84	8	46.10	12.735
$\beta$ Coronæ Borealis	3.9	15	23	52.264	2.4736	+ 29	26	10.95	12.546
$\alpha$ Coronæ Borealis	2.3	15	30	37.380	2.5392	+ 27	2	14.94	12.260
$\alpha$ Serpentis	2.7	15	39	32.316	2.9524	+ 6	43	38.55	11.489
$\epsilon$ Serpentis	3.7	15	46	1.780	+ 2.9876	+ 4	45	59.45	- 10.993
$\zeta$ Ursæ Minoris	4.6	15	47	28.455	- 2.2256	+ 78	5	24.08	10.960
$\epsilon$ Coronæ Borealis	4.1	15	53	36.741	+ 2.4820	+ 27	9	20.05	10.570
$\delta$ Scorpii	2.6	15	54	39.291	3.5406	- 22	20	55.59	10.460
$\beta^1$ Scorpii	2.9	15	59	51.163	3.4820	- 19	32	34.56	10.062
$\phi$ Herculis	4.2	16	5	44.700	+ 1.8893	+ 45	11	11.05	- 9.548
$\delta^1$ Apodis	4.9	16	5	58.823	8.8165	- 78	27	16.29	9.622
Groombridge 2320	5.5	16	6	3.508	0.1484	+ 68	3	46.59	9.509
$\delta$ Ophiuchi	2.8	16	9	18.822	3.1406	- 3	26	50.66	9.454
$\sigma$ Coronæ Borealis	5.3	16	11	4.995	2.2455	+ 34	6	6.31	9.244
$\tau$ Herculis	3.9	16	16	51.318	+ 1.8026	+ 46	32	30.24	- 8.691
$\gamma$ Apodis	4.0	16	18	42.480	+ 9.0673	- 78	40	55.91	8.656
$\gamma$ Ursæ Minoris	5.0	16	20	18.083	- 1.8029	+ 75	58	36.29	8.196
$\gamma$ Draconis	2.8	16	22	41.399	+ 0.8058	+ 61	43	52.97	8.200
$\alpha$ Scorpii ( <i>Antares</i> )	1.2	16	23	31.168	3.6725	- 26	13	9.31	8.220
$\beta$ Herculis	2.8	16	26	5.527	+ 2.5770	+ 21	41	54.35	- 8.011
A Draconis	5.0	16	28	10.034	0.1341	+ 68	58	33.04	7.783
$\zeta$ Ophiuchi	2.8	16	31	52.289	+ 3.2999	- 10	22	22.58	7.498
$\alpha$ Trianguli Australis	2.2	16	38	29.601	6.3138	- 68	51	6.82	7.029
$\gamma$ Herculis	3.7	16	39	36.261	2.0553	+ 39	6	16.29	6.982
$\kappa$ Ophiuchi	3.4	16	53	7.421	+ 2.8377	+ 9	31	26.18	- 5.778
$\epsilon$ Ursæ Minoris	4.5	16	55	47.026	- 6.2928	+ 82	11	45.57	5.544
$d$ Herculis	5.3	16	58	3.662	+ 2.2117	+ 33	42	24.91	5.361
$\gamma$ Ophiuchi	2.5	17	4	52.267	3.4367	- 15	36	22.76	4.684
$d^1$ Herculis ( <i>var.</i> )	3.2	17	10	16.184	2.7341	+ 14	29	57.85	4.286
$\pi$ Herculis	3.4	17	11	42.168	+ 2.0881	+ 36	55	1.41	- 4.194
$\theta$ Ophiuchi	3.3	17	16	6.762	3.6809	- 24	54	14.52	3.851
$b$ Ophiuchi ( <i>var.</i> )	4.4	17	20	30.361	3.6601	- 24	5	14.65	3.575
$\delta$ Aræ	3.8	17	22	25.777	5.4030	- 60	36	15.62	3.391
$\beta$ Draconis	3.0	17	28	15.790	1.3537	+ 52	22	20.15	2.758
$\alpha$ Ophiuchi	2.2	17	30	28.670	+ 2.7834	+ 12	37	46.33	- 2.810
$\epsilon$ Herculis	4.0	17	36	45.312	+ 1.6932	+ 46	3	25.95	2.027
$\omega$ Draconis	4.9	17	37	30.751	- 0.3554	+ 68	48	8.45	1.646
$\mu$ Herculis	3.5	17	42	42.063	+ 2.3466	+ 27	46	35.52	2.260
$\phi^1$ Draconis	4.8	17	43	38.635	- 1.0764	+ 72	11	45.88	1.697
$\theta$ Herculis	3.9	17	52	57.637	+ 2.0568	+ 37	15	46.61	- 0.611
$\gamma$ Draconis	2.5	17	54	22.616	1.3922	+ 51	29	59.89	0.516
$\gamma^2$ Sagittarii	2.9	17	59	38.408	+ 3.8517	- 30	25	32.05	- 0.229
$\delta$ Ursæ Minoris	4.4	18	3	14.76*	- 19.4928	+ 86	36	49.26	+ 0.331
$\alpha$ Herculis	3.9	18	3	47.848	+ 2.3392	+ 28	44	56.32	0.334
$\mu$ Sagittarii	4.1	18	8	1.313	+ 3.5869	- 21	5	3.38	+ 0.700
$\gamma$ Serpentis	3.5	18	16	20.512	3.1026	- 2	55	26.41	0.737
$\lambda$ Sagittarii	2.9	18	22	2.775	+ 3.7029	- 25	28	30.54	+ 1.727

MEAN PLACES FOR 1904.0. (January 1 <sup>d</sup> .068, Washington.)									
Name of Star.	Magni- tude.	Right Ascension.			Annual Variation.	Declination.		Annual Variation.	
		h	m	s	s	°	'	"	
$\chi$ Draconis . . . .	3.8	18	22	47.368	- 1.0776	+ 72	41	28.52	+ 1.616
$\iota$ Aquilæ . . . .	4.0	18	29	58.980	+ 3.2646	- 8	18	41.35	2.300
$\zeta$ Pavonis . . . .	4.2	18	31	49.149	7.0249	- 71	30	38.98	2.610
$\alpha$ Lyræ ( <i>Vega</i> ) . . . .	0.2	18	33	41.287	2.0313	+ 38	41	38.55	3.216
$\beta$ Lyræ ( <i>var.</i> ) . . . .	3.6	18	46	32.128	2.2146	+ 33	15	3.35	4.037
$\sigma$ Sagittarii . . . .	2.3	18	49	18.750	+ 3.7207	- 26	24	58.77	+ 4.205
50 Draconis . . . .	5.6	18	49	28.511	- 1.9140	+ 75	19	14.85	4.345
$\gamma$ Lyræ . . . .	3.3	18	55	21.133	+ 2.2433	+ 32	33	27.21	4.789
$\zeta$ Aquilæ . . . .	3.1	19	0	59.858	2.7568	+ 13	43	13.54	5.174
$\epsilon$ Lyræ . . . .	5.2	19	3	52.584	2.1411	+ 35	56	57.39	5.509
$\sigma$ Octantis . . . .	5.6	19	6	29.75*	+ 100.8138	- 89	14	54.65	+ 5.733
$\delta$ Sagittarii . . . .	5.0	19	12	1.112	3.5116	- 19	7	26.62	6.180
$\delta$ Draconis . . . .	3.1	19	12	32.110	0.0249	+ 67	29	33.60	6.327
$\theta$ Lyræ . . . .	4.4	19	13	2.138	+ 2.0807	+ 37	57	45.22	6.287
$\tau$ Draconis . . . .	4.5	19	17	24.265	- 1.1291	+ 73	10	38.72	6.752
$\lambda$ Ursæ Minoris . . . .	6.5	19	17	56.16*	- 68.8809	+ 88	59	43.34	+ 6.695
$\delta$ Aquilæ . . . .	3.5	19	20	39.494	+ 3.0251	+ 2	55	22.97	6.991
$\beta$ Cygni . . . .	3.1	19	26	50.981	2.4188	+ 27	45	27.85	7.406
$\kappa$ Aquilæ . . . .	5.0	19	31	43.661	3.2293	- 7	14	28.06	7.813
$\beta$ Sagittæ . . . .	4.5	19	36	44.223	2.6939	+ 17	15	12.02	8.181
$\gamma$ Aquilæ . . . .	2.8	19	41	41.741	+ 2.8521	+ 10	22	44.33	+ 8.603
$\delta$ Cygni . . . .	2.9	19	41	58.509	1.8760	+ 44	53	46.29	8.672
$\alpha$ Aquilæ ( <i>Altair</i> ) . . . .	0.9	19	46	5.970	+ 2.9273	+ 8	36	51.97	9.330
$\epsilon$ Draconis . . . .	3.9	19	48	30.164	- 0.1828	+ 70	1	24.25	9.167
$\epsilon$ Pavonis . . . .	4.1	19	49	29.776	+ 7.0055	- 73	9	50.69	9.097
$\beta$ Aquilæ . . . .	3.9	19	50	35.866	+ 2.9470	+ 6	10	0.08	+ 8.822
$\gamma$ Sagittæ . . . .	3.6	19	54	29.256	2.6673	+ 19	13	52.00	9.628
$\epsilon$ Sagittarii . . . .	4.5	19	56	45.390	3.6945	- 27	58	37.31	9.790
$\tau$ Aquilæ . . . .	5.7	19	59	27.034	2.9310	+ 7	0	24.91	10.011
$\theta$ Aquilæ . . . .	3.3	20	6	21.121	3.0964	- 1	6	23.38	10.506
31 Cygni . . . .	3.9	20	10	36.560	+ 1.8901	+ 46	26	59.85	+ 10.821
$\kappa$ Cephei ( <i>pr.</i> ) . . . .	4.4	20	12	7.981	- 1.9468	+ 77	25	20.99	10.953
$\alpha^2$ Capricorni . . . .	3.7	20	12	43.745	+ 3.3314	- 12	50	33.61	10.979
$\alpha$ Pavonis . . . .	2.1	20	18	3.367	4.7709	- 57	2	34.81	11.266
$\gamma$ Cygni . . . .	2.3	20	18	46.965	2.1524	+ 39	56	56.91	11.412
$\pi$ Capricorni . . . .	5.1	20	21	49.635	+ 3.4376	- 18	31	35.77	+ 11.626
$\epsilon$ Delphini . . . .	4.0	20	28	37.613	+ 2.8665	+ 10	58	36.05	12.083
Groombridge 3241 . . . .	6.5	20	30	25.586	- 0.2312	+ 72	12	23.23	12.215
$\alpha$ Delphini . . . .	3.9	20	35	10.759	+ 2.7868	+ 15	34	23.85	12.577
$\beta$ Pavonis . . . .	3.4	20	36	18.851	5.4560	- 66	32	54.65	12.634
$\alpha$ Cygni . . . .	1.4	20	38	9.539	+ 2.0445	+ 44	56	13.33	+ 12.759
$\psi$ Capricorni . . . .	4.3	20	40	24.805	3.5585	- 25	36	57.47	12.766
$\epsilon$ Cygni . . . .	2.6	20	42	19.613	2.4272	+ 33	36	37.49	13.307
$\mu$ Aquarii . . . .	4.8	20	47	28.610	+ 3.2387	- 9	20	37.90	13.341
12 Year Catalogue 1879 . . . .	5.3	20	51	57.702	- 2.5932	+ 80	11	33.21	13.644
$\nu$ Cygni . . . .	4.1	20	53	35.629	+ 2.2351	+ 40	47	50.15	+ 13.756
61 Cygni . . . .	5.4	21	2	35.560	2.6848	+ 38	16	37.34	17.570
$\zeta$ Cygni . . . .	3.3	21	8	51.001	+ 2.5516	+ 29	49	58.36	+ 14.651



MEAN PLACES FOR 1904.0. (January 1<sup>d</sup>.068, Washington.)

Name of Star.	Magni- tude.	Right Ascension			Annual Variation	Declination.			Annual Variation.
		h	m	s	s	°	'	"	"
$\tau$ Cygni . . . . .	3.8	21	10	57.517	+ 2.3935	+ 37	38	7.41	+ 15.270
$\alpha$ Cephei . . . . .	2.6	21	16	17.364	1.4357	+ 62	10	43.28	15.195
$\iota$ Pegasi . . . . .	4.3	21	17	38.802	2.7738	+ 19	23	36.75	15.287
$\zeta$ Capricorni . . . . .	3.8	21	21	11.289	3.4321	- 22	49	38.42	15.443
$\beta$ Aquarii . . . . .	2.9	21	26	30.359	3.1607	- 5	59	37.52	15.705
$\beta$ Cephei ( <i>pr.</i> ) . . . . .	3.4	21	27	25.493	+ 0.7899	+ 70	8	21.14	+ 15.771
$\xi$ Aquarii . . . . .	4.8	21	32	38.541	3.1966	- 8	17	5.78	16.020
74 Cygni . . . . .	5.0	21	33	6.052	2.4026	+ 39	58	55.34	16.077
$\lambda^1$ Octantis . . . . .	5.4	21	36	14.975	9.6513	- 83	9	38.51	16.218
$\epsilon$ Pegasi . . . . .	2.4	21	39	28.253	2.9462	+ 9	26	4.66	16.394
$\iota$ Cephei . . . . .	4.8	21	40	31.050	+ 0.8918	+ 70	52	9.42	+ 16.540
$\pi^2$ Cygni . . . . .	4.5	21	43	14.756	2.2136	+ 48	51	54.73	16.581
$\mu$ Capricorni . . . . .	5.2	21	48	3.785	3.2743	- 14	0	14.25	16.816
16 Pegasi . . . . .	5.1	21	48	41.616	2.7278	+ 25	28	23.97	16.851
79 Draconis . . . . .	6.6	21	51	39.874	0.7241	+ 73	14	52.95	17.000
$\alpha$ Aquarii . . . . .	3.0	22	0	51.226	+ 3.0825	- 0	47	10.94	+ 17.396
$\alpha$ Gruis . . . . .	1.9	22	2	11.131	3.7989	- 47	25	34.31	17.281
$\pi^2$ Pegasi . . . . .	4.3	22	5	43.387	2.6617	+ 32	42	25.07	17.587
$\theta$ Aquarii . . . . .	4.4	22	11	46.117	3.1680	- 8	15	41.14	17.834
$\nu$ Octantis . . . . .	6.2	22	13	26.07*	12.7085	- 86	27	21.73	17.993
$\gamma$ Aquarii . . . . .	4.0	22	16	41.895	+ 3.0996	- 1	52	16.16	+ 18.060
$\pi$ Aquarii . . . . .	4.6	22	20	22.460	3.0641	+ 0	53	24.19	18.181
$\sigma$ Aquarii . . . . .	4.9	22	25	34.083	3.1781	- 11	10	9.48	18.343
$\alpha$ Lacertæ . . . . .	3.9	22	27	20.125	2.4662	+ 49	47	19.55	18.443
$\eta$ Aquarii . . . . .	4.2	22	30	25.420	3.0835	- 0	36	44.70	18.482
226 Cephei (B.) . . . . .	5.7	22	30	35.369	+ 1.0687	+ 75	43	53.95	+ 18.540
10 Lacertæ . . . . .	5.0	22	34	57.155	2.6874	+ 38	33	1.61	18.671
$\beta$ Octantis . . . . .	4.4	22	36	16.463	6.3903	- 81	53	6.04	18.726
$\zeta$ Pegasi . . . . .	3.5	22	36	40.438	2.9912	+ 10	19	48.16	18.722
$\lambda$ Pegasi . . . . .	4.1	22	41	54.357	2.8860	+ 23	3	37.16	18.885
$\iota$ Cephei . . . . .	3.6	22	46	15.657	+ 2.1256	+ 65	41	43.31	+ 18.892
$\lambda$ Aquarii . . . . .	3.8	22	47	36.407	3.1316	- 8	5	25.98	19.090
$\alpha$ Pis. Austr. ( <i>Fomalhaut</i> ) . . . . .	1.3	22	52	20.865	3.3233	- 30	7	52.20	19.008
$\nu$ Andromedæ . . . . .	3.8	22	57	30.117	2.7525	+ 41	48	35.77	19.296
$\alpha$ Pegasi ( <i>Markab</i> ) . . . . .	2.5	22	59	58.683	2.9857	+ 14	41	19.12	19.324
$\phi$ Aquarii . . . . .	4.3	23	9	21.054	+ 3.1076	- 6	33	59.88	+ 19.365
$\nu$ Cephei . . . . .	5.1	23	14	40.822	2.4471	+ 67	35	10.26	19.673
$\tau$ Pegasi . . . . .	4.6	23	15	53.037	2.9645	+ 23	12	53.16	19.664
$\theta$ Piscium . . . . .	4.3	23	23	5.874	3.0417	+ 5	51	5.99	19.746
$\lambda$ Andromedæ . . . . .	3.8	23	32	51.779	2.9251	+ 45	56	16.86	19.486
$\iota$ Piscium . . . . .	4.3	23	35	0.730	+ 3.0840	+ 5	6	21.35	+ 19.491
$\gamma$ Cephei . . . . .	3.5	23	35	24.199	2.4304	+ 77	5	47.65	20.088
$i^1$ Aquarii . . . . .	5.2	23	39	13.403	3.1155	- 18	48	35.41	19.959
$\delta$ Sculptoris . . . . .	4.6	23	43	55.570	3.1295	- 28	39	41.13	19.864
$\gamma^1$ Octantis . . . . .	5.2	23	46	29.237	3.6499	- 82	33	8.44	20.000
Groombridge 4163 . . . . .	6.6	23	50	9.079	+ 2.8698	+ 73	52	33.91	+ 20.023
$\omega$ Piscium . . . . .	4.2	23	54	22.867	+ 3.0790	+ 6	19	54.79	+ 19.933

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

α Ursæ Min. (Polaris).			51 Cephei (Hæv.).			δ Ursæ Min.			λ Ursæ Min.			σ Octantis.		
Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion South.
Jan.	h m 1 24	° +88 47	Jan.	h m 6 56	° +87 11	Jan.	h m 18 2	° +86 36	Jan.	h m 19 16	° +88 59	Jan.	h m 19 4	° -89 14
	s	"		s	"		s	"		s	"		s	"
0.3	59.75	58.1	0.5	7.27	49.8	0.9	51.80	56.2	1.0	51.02	56.5	1.0	34.55	47.6
1.3	58.85	58.3	1.5	7.43	50.1	1.9	51.76	55.8	2.0	50.44	56.2	2.0	34.96	47.3
2.3	57.91	58.5	2.5	7.62	50.4	2.9	51.73	55.5	3.0	49.90	55.8	3.0	35.42	47.0
3.3	56.91	58.6	3.5	7.79	50.7	3.9	51.73	55.1	4.0	49.41	55.5	4.0	35.88	46.7
4.3	55.85	58.8	4.5	7.94	51.1	4.9	51.73	54.7	5.0	48.99	55.1	5.0	36.30	46.4
5.3	54.74	58.9	5.5	8.04	51.4	5.9	51.76	54.3	6.0	48.64	54.8	5.9	36.66	46.1
6.3	53.62	59.0	6.5	8.12	51.8	6.9	51.83	54.0	7.0	48.39	54.4	6.9	36.98	45.7
7.3	52.51	59.0	7.5	8.16	52.1	7.9	51.91	53.6	8.0	48.22	54.1	7.9	37.25	45.4
8.3	51.43	59.1	8.5	8.19	52.5	8.9	52.01	53.3	8.9	48.09	53.7	8.9	37.51	45.1
9.3	50.39	59.1	9.5	8.19	52.8	9.9	52.09	53.0	9.9	48.00	53.4	9.9	37.80	44.7
10.2	49.42	59.2	10.5	8.20	53.1	10.9	52.18	52.7	10.9	47.92	53.1	10.9	38.15	44.4
11.2	48.48	59.2	11.5	8.22	53.4	11.9	52.27	52.4	11.9	47.80	52.8	11.9	38.59	44.0
12.2	47.57	59.2	12.5	8.24	53.7	12.9	52.35	52.1	12.9	47.67	52.5	12.9	39.15	43.6
13.2	46.67	59.3	13.5	8.27	54.0	13.9	52.41	51.8	13.9	47.49	52.2	13.9	39.80	43.3
14.2	45.74	59.3	14.5	8.31	54.3	14.9	52.48	51.5	14.9	47.30	51.9	14.9	40.54	42.9
15.2	44.76	59.4	15.5	8.35	54.6	15.9	52.55	51.1	15.9	47.10	51.6	15.9	41.34	42.6
16.2	43.73	59.5	16.5	8.38	54.9	16.9	52.63	50.8	16.9	46.95	51.2	16.9	42.17	42.3
17.2	42.62	59.5	17.5	8.39	55.2	17.9	52.73	50.4	17.9	46.85	50.9	17.9	42.98	42.0
18.2	41.48	59.5	18.5	8.37	55.6	18.9	52.87	50.1	18.9	46.83	50.5	18.9	43.75	41.7
19.2	40.31	59.6	19.5	8.33	56.0	19.9	53.03	49.7	19.9	46.89	50.1	19.9	44.45	41.4
20.2	39.14	59.5	20.4	8.26	56.3	20.9	53.20	49.4	20.9	47.05	49.8	20.9	45.10	41.1
21.2	38.00	59.5	21.4	8.16	56.7	21.9	53.40	49.1	21.9	47.27	49.4	21.9	45.73	40.8
22.2	36.91	59.5	22.4	8.03	57.0	22.9	53.61	48.8	22.9	47.53	49.1	22.9	46.36	40.5
23.2	35.88	59.4	23.4	7.91	57.3	23.9	53.80	48.5	23.9	47.80	48.8	23.9	47.04	40.1
24.2	34.91	59.3	24.4	7.79	57.6	24.9	53.99	48.2	24.9	48.07	48.5	24.9	47.80	39.8
25.2	33.97	59.3	25.4	7.67	57.9	25.9	54.16	47.9	25.9	48.31	48.2	25.9	48.67	39.4
26.2	33.07	59.2	26.4	7.57	58.1	26.9	54.32	47.7	26.9	48.49	47.9	26.9	49.65	39.1
27.2	32.18	59.2	27.4	7.49	58.4	27.9	54.48	47.4	27.9	48.64	47.6	27.9	50.75	38.7
28.2	31.25	59.2	28.4	7.41	58.7	28.9	54.62	47.1	28.9	48.77	47.3	28.9	51.94	38.4
29.2	30.29	59.1	29.4	7.35	59.0	29.9	54.78	46.8	29.9	48.88	47.0	29.9	53.18	38.1
30.2	29.27	59.1	30.4	7.27	59.3	30.9	54.94	46.5	30.9	49.05	46.6	30.9	54.44	37.8
31.2	28.20	59.1	31.4	7.18	59.6	31.9	55.12	46.2	31.9	49.27	46.3	31.9	55.67	37.5
32.2	27.10	59.0	32.4	7.06	60.0	32.9	55.34	45.9	32.9	49.57	45.9	32.9	56.85	37.3

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Ursæ Min. (Polaris).		Mean Solar Date.	51 Cephei (Hæv.).		Mean Solar Date.	$\delta$ Ursæ Min.		Mean Solar Date.	$\lambda$ Ursæ Min.		Mean Solar Date.	$\sigma$ Octantis.	
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion South.
Feb.	h m 1 24	° +88 47	Feb.	h m 6 55	° +87 12	Feb.	h m 18 2	° +86 36	Feb.	h m 19 16	° +88 59	Feb.	h m 19 4	° -89 14
	s "	"		s "	"		s "	"		s "	"		s "	"
1.2	27.10	59.0	1.4	67.06	0.0	1.9	55.34	45.9	1.9	49.57	45.9	1.9	56.85	37.3
2.2	25.97	58.9	2.4	66.91	0.3	2.9	55.58	45.6	2.9	49.96	45.6	2.9	57.97	37.0
3.2	24.87	58.8	3.4	66.71	0.6	3.9	55.83	45.3	3.9	50.44	45.3	3.9	59.04	36.8
4.2	23.81	58.7	4.4	66.50	0.9	4.9	56.11	45.0	4.9	50.98	44.9	4.9	60.07	36.5
5.2	22.79	58.6	5.4	66.27	1.2	5.9	56.38	44.8	5.9	51.56	44.6	5.9	61.10	36.2
6.2	21.85	58.5	6.4	66.03	1.5	6.9	56.66	44.6	6.9	52.15	44.3	6.9	62.16	35.9
7.2	20.96	58.3	7.4	65.80	1.8	7.9	56.92	44.4	7.9	52.72	44.1	7.9	63.31	35.6
8.2	20.11	58.2	8.4	65.58	2.0	8.9	57.17	44.1	8.9	53.27	43.8	8.9	64.56	35.3
9.2	19.28	58.0	9.4	65.37	2.2	9.9	57.41	43.9	9.9	53.78	43.6	9.9	65.91	35.0
10.2	18.45	57.9	10.4	65.16	2.5	10.9	57.63	43.7	10.9	54.27	43.3	10.9	67.34	34.7
11.2	17.59	57.8	11.4	64.97	2.7	11.9	57.87	43.5	11.9	54.73	43.0	11.9	68.82	34.4
12.2	16.70	57.7	12.4	64.77	3.0	12.9	58.12	43.3	12.9	55.22	42.7	12.9	70.35	34.1
13.2	15.74	57.6	13.4	64.57	3.3	13.9	58.38	43.0	13.9	55.76	42.4	13.9	71.87	33.9
14.2	14.75	57.4	14.4	64.34	3.6	14.9	58.66	42.8	14.9	56.35	42.1	14.9	73.34	33.7
15.1	13.73	57.3	15.4	64.08	3.9	15.9	58.97	42.5	15.9	57.02	41.8	15.9	74.74	33.5
16.1	12.70	57.1	16.4	63.79	4.2	16.8	59.31	42.3	16.9	57.78	41.5	16.9	76.09	33.2
17.1	11.71	56.9	17.4	63.47	4.4	17.8	59.65	42.1	17.9	58.61	41.2	17.9	77.39	33.0
18.1	10.77	56.7	18.4	63.14	4.7	18.8	60.00	41.9	18.9	59.49	40.9	18.9	78.67	32.8
19.1	9.89	56.5	19.4	62.79	4.9	19.8	60.35	41.7	19.9	60.40	40.6	19.9	79.95	32.5
20.1	9.08	56.3	20.4	62.46	5.2	20.8	60.68	41.5	20.9	61.29	40.4	20.9	81.29	32.3
21.1	8.33	56.0	21.4	62.12	5.4	21.8	61.01	41.4	21.9	62.16	40.2	21.9	82.73	32.0
22.1	7.64	55.8	22.4	61.80	5.6	22.8	61.32	41.3	22.9	62.98	40.0	22.9	84.27	31.7
23.1	6.97	55.6	23.4	61.50	5.7	23.8	61.61	41.1	23.9	63.74	39.8	23.9	85.91	31.5
24.1	6.28	55.4	24.3	61.22	5.9	24.8	61.90	41.0	24.9	64.46	39.5	24.9	87.65	31.2
25.1	5.58	55.2	25.3	60.93	6.1	25.8	62.19	40.8	25.9	65.17	39.3	25.9	89.45	31.0
26.1	4.84	55.1	26.3	60.66	6.4	26.8	62.48	40.7	26.9	65.89	39.1	26.9	91.28	30.8
27.1	4.06	54.9	27.3	60.38	6.6	27.8	62.78	40.5	27.9	66.65	38.8	27.8	93.08	30.6
28.1	3.24	54.7	28.3	60.06	6.8	28.8	63.11	40.3	28.9	67.48	38.6	28.8	94.82	30.5
29.1	2.41	54.5	29.3	59.73	7.0	29.8	63.48	40.1	29.9	68.39	38.3	29.8	96.50	30.3
30.1	1.59	54.2	30.3	59.36	7.3	30.8	63.85	40.0	30.9	69.39	38.1	30.8	98.11	30.1

## CIRCUMPOLAR STARS.

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	<i>a</i> Ursæ Min. ( <i>Polaris</i> ).		Mean Solar Date.	51 Cephei ( <i>Hev.</i> ).		Mean Solar Date.	<i>δ</i> Ursæ Min.		Mean Solar Date.	<i>λ</i> Ursæ Min.		Mean Solar Date.	<i>σ</i> Octantis.	
	Right Ascension.	Declina- tion <i>North</i> .		Right Ascension.	Declina- tion <i>North</i> .		Right Ascension.	Declina- tion <i>North</i> .		Right Ascension.	Declina- tion <i>North</i> .		Right Ascension.	Declina- tion <i>South</i> .
Mar.	h m 1 23	° +88 47	Mar.	h m 6 55	° +87 12	Mar.	h m 18 3	° +86 36	Mar.	h m 19 17	° +88 59	Mar.	h m 19 5	° -89 14
	s	"		s	"		s	"		s	"		s	"
1.1	61.59	54.2	1.3	59.36	7.3	1.8	3.85	40.0	1.9	9.39	38.1	1.8	38.11	30.1
2.1	60.80	54.0	2.3	58.98	7.5	2.8	4.23	39.9	2.9	10.44	37.8	2.8	39.68	30.0
3.1	60.08	53.7	3.3	58.57	7.7	3.8	4.62	39.8	3.9	11.53	37.6	3.8	41.21	29.8
4.1	59.43	53.4	4.3	58.16	7.8	4.8	4.99	39.7	4.9	12.63	37.4	4.8	42.76	29.6
5.1	58.85	53.1	5.3	57.75	8.0	5.8	5.36	39.6	5.8	13.73	37.3	5.8	44.36	29.4
6.1	58.32	52.8	6.3	57.36	8.1	6.8	5.72	39.5	6.8	14.78	37.1	6.8	46.03	29.2
7.1	57.83	52.6	7.3	56.97	8.2	7.8	6.06	39.5	7.8	15.79	37.0	7.8	47.79	29.0
8.1	57.36	52.3	8.3	56.59	8.3	8.8	6.39	39.4	8.8	16.76	36.8	8.8	49.63	28.8
9.1	56.88	52.1	9.3	56.24	8.4	9.8	6.72	39.4	9.8	17.70	36.7	9.8	51.54	28.6
10.1	56.37	51.8	10.3	55.90	8.6	10.8	7.04	39.3	10.8	18.62	36.5	10.8	53.49	28.4
11.1	55.83	51.6	11.3	55.54	8.7	11.8	7.38	39.2	11.8	19.59	36.4	11.8	55.44	28.3
12.1	55.25	51.3	12.3	55.17	8.9	12.8	7.73	39.1	12.8	20.59	36.2	12.8	57.35	28.2
13.1	54.65	51.1	13.3	54.78	9.0	13.8	8.10	39.0	13.8	21.67	36.0	13.8	59.17	28.1
14.1	54.02	50.8	14.3	54.36	9.2	14.8	8.49	38.9	14.8	22.82	35.8	14.8	60.91	28.0
15.1	53.42	50.5	15.3	53.92	9.3	15.8	8.90	38.9	15.8	24.05	35.6	15.8	62.58	27.9
16.1	52.88	50.2	16.3	53.46	9.4	16.8	9.32	38.8	16.8	25.32	35.5	16.8	64.22	27.8
17.1	52.39	49.8	17.3	52.99	9.5	17.8	9.74	38.8	17.8	26.62	35.4	17.8	65.85	27.7
18.1	52.00	49.5	18.3	52.53	9.6	18.8	10.14	38.8	18.8	27.89	35.3	18.8	67.50	27.5
19.1	51.66	49.1	19.3	52.07	9.7	19.8	10.52	38.9	19.8	29.14	35.2	19.8	69.22	27.4
20.1	51.39	48.8	20.3	51.62	9.7	20.8	10.87	38.9	20.8	30.34	35.1	20.8	71.04	27.2
21.1	51.15	48.5	21.3	51.20	9.8	21.8	11.22	38.9	21.8	31.47	35.0	21.8	72.95	27.1
22.0	50.92	48.2	22.3	50.81	9.8	22.7	11.56	39.0	22.8	32.55	35.0	22.8	74.96	27.0
23.0	50.68	48.0	23.3	50.42	9.9	23.7	11.87	39.0	23.8	33.59	34.9	23.8	77.02	26.9
24.0	50.43	47.7	24.3	50.05	9.9	24.7	12.20	39.0	24.8	34.61	34.8	24.8	79.11	26.8
25.0	50.14	47.4	25.3	49.67	10.0	25.7	12.53	39.0	25.8	35.66	34.7	25.8	81.17	26.7
26.0	49.81	47.1	26.3	49.28	10.0	26.7	12.88	39.0	26.8	36.75	34.6	26.8	83.20	26.7
27.0	49.47	46.9	27.3	48.88	10.1	27.7	13.24	39.0	27.8	37.90	34.5	27.8	85.14	26.6
28.0	49.12	46.6	28.3	48.44	10.2	28.7	13.62	39.0	28.8	39.12	34.4	28.8	87.00	26.6
29.0	48.81	46.2	29.3	47.99	10.2	29.7	14.02	39.0	29.8	40.40	34.3	29.8	88.79	26.5
30.0	48.56	45.9	30.3	47.52	10.3	30.7	14.41	39.1	30.8	41.71	34.3	30.8	90.53	26.5
31.0	48.36	45.6	31.3	47.05	10.3	31.7	14.81	39.2	31.8	43.04	34.2	31.8	92.26	26.4
32.0	48.25	45.2	32.2	46.57	10.3	32.7	15.18	39.3	32.8	44.36	34.2	32.8	94.02	26.3

**APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.**

Mean Solar Date.	α Ursæ Min. (Polaris).		Mean Solar Date.	51 Cephei (Hæv.).		Mean Solar Date.	δ Ursæ Min.		Mean Solar Date.	λ Ursæ Min.		Mean Solar Date.	σ Octantis.	
	Right Ascension.	Declination North.		Right Ascension.	Declination North.		Right Ascension.	Declination North.		Right Ascension.	Declination North.		Right Ascension.	Declination South.
Apr.	h m 1 23	° +88 47	Apr.	h m 6 55	° +87 12	Apr.	h m 18 3	° +86 36	Apr.	h m 19 17	° +88 59	Apr.	h m 19 6	° -89 14
1.0	ε 48.25	45.2	1.2	ς 46.57	10.3	1.7	ς 15.18	39.3	1.8	ς 44.36	34.2	1.8	ς 34.02	26.3
2.0	48.21	44.9	2.2	46.10	10.3	2.7	15.54	39.4	2.8	45.64	34.2	2.8	35.84	26.3
3.0	48.23	44.5	3.2	45.67	10.2	3.7	15.88	39.5	3.8	46.87	34.3	3.8	37.74	26.2
4.0	48.27	44.2	4.2	45.25	10.2	4.7	16.20	39.6	4.8	48.04	34.3	4.8	39.70	26.1
5.0	48.31	43.9	5.2	44.85	10.1	5.7	16.52	39.7	5.8	49.14	34.3	5.7	41.74	26.0
6.0	48.33	43.6	6.2	44.46	10.1	6.7	16.84	39.8	6.8	50.23	34.3	6.7	43.79	26.0
7.0	48.31	43.3	7.2	44.07	10.1	7.7	17.14	39.9	7.8	51.32	34.3	7.7	45.86	26.0
8.0	48.26	43.0	8.2	43.68	10.1	8.7	17.47	40.0	8.8	52.44	34.3	8.7	47.89	26.0
9.0	48.17	42.8	9.2	43.28	10.0	9.7	17.80	40.1	9.8	53.60	34.3	9.7	49.83	26.0
10.0	48.07	42.5	10.2	42.86	10.0	10.7	18.16	40.2	10.8	54.82	34.3	10.7	51.69	26.1
11.0	47.99	42.1	11.2	42.41	10.0	11.7	18.53	40.3	11.7	56.11	34.3	11.7	53.46	26.1
12.0	47.95	41.8	12.2	41.96	10.0	12.7	18.90	40.4	12.7	57.44	34.3	12.7	55.18	26.1
13.0	47.97	41.5	13.2	41.48	9.9	13.7	19.28	40.5	13.7	58.79	34.3	13.7	56.84	26.1
13.9	48.06	41.1	14.2	41.00	9.9	14.7	19.65	40.7	14.7	60.13	34.4	14.7	58.52	26.1
14.9	48.22	40.7	15.2	40.55	9.8	15.7	20.00	40.9	15.7	61.44	34.4	15.7	60.25	26.1
15.9	48.46	40.4	16.2	40.12	9.6	16.7	20.32	41.1	16.7	62.68	34.5	16.7	62.04	26.1
16.9	48.74	40.1	17.2	39.70	9.5	17.7	20.61	41.3	17.7	63.86	34.6	17.7	63.93	26.1
17.9	49.05	39.8	18.2	39.31	9.4	18.7	20.89	41.5	18.7	64.95	34.7	18.7	65.88	26.1
18.9	49.35	39.5	19.2	38.96	9.3	19.7	21.16	41.7	19.7	65.99	34.8	19.7	67.89	26.1
19.9	49.64	39.2	20.2	38.61	9.2	20.7	21.42	41.8	20.7	67.00	34.9	20.7	69.95	26.2
20.9	49.89	39.0	21.2	38.28	9.1	21.7	21.68	42.0	21.7	68.00	35.0	21.7	71.99	26.2
21.9	50.09	38.7	22.2	37.92	9.0	22.7	21.94	42.1	22.7	69.02	35.0	22.7	73.99	26.3
22.9	50.28	38.4	23.2	37.56	8.9	23.7	22.22	42.3	23.7	70.10	35.1	23.7	75.90	26.4
23.9	50.46	38.1	24.2	37.19	8.8	24.7	22.52	42.4	24.7	71.22	35.2	24.7	77.72	26.5
24.9	50.65	37.8	25.2	36.79	8.7	25.7	22.82	42.6	25.7	72.41	35.2	25.7	79.45	26.6
25.9	50.90	37.5	26.2	36.38	8.6	26.7	23.12	42.8	26.7	73.63	35.3	26.7	81.13	26.7
26.9	51.21	37.2	27.2	35.97	8.5	27.7	23.43	43.0	27.7	74.85	35.4	27.7	82.75	26.7
27.9	51.59	36.9	28.2	35.56	8.3	28.7	23.72	43.3	28.7	76.05	35.6	28.7	84.39	26.8
28.9	52.05	36.6	29.2	35.15	8.2	29.6	24.00	43.5	29.7	77.22	35.7	29.7	86.05	26.8
29.9	52.55	36.3	30.2	34.77	8.0	30.6	24.26	43.8	30.7	78.32	35.9	30.7	87.79	26.9
30.9	53.10	36.0	31.2	34.42	7.8	31.6	24.49	44.1	31.7	79.36	36.1	31.7	89.58	26.9
31.9	53.65	35.7												

## CIRCUMPOLAR STARS.

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	<i>α</i> Ursæ Min. ( <i>Polaris</i> ).		Mean Solar Date.	51 Cephei ( <i>Hæv.</i> ).		Mean Solar Date.	<i>δ</i> Ursæ Min.		Mean Solar Date.	<i>λ</i> Ursæ Min.		Mean Solar Date.	<i>σ</i> Octantis.	
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion South.
	h m ° ' "	° ' "		h m ° ' "	° ' "		h m ° ' "	° ' "		h m ° ' "	° ' "		h m ° ' "	° ' "
May	1 23	+88 47	May	6 55	+87 12	May	18 3	+86 36	May	19 18	+88 59	May	19 7	-89 14
	s	"		s	"		s	"		s	"		s	"
1-9	53.65	35.7	1-2	34.42	7.8	1-6	24.49	44.1	1-7	19.36	36.1	1-7	29.58	26.9
2-9	54.18	35.4	2-2	34.10	7.6	2-6	24.70	44.3	2-7	20.33	36.3	2-7	31.45	27.0
3-9	54.69	35.2	3-2	33.79	7.4	3-6	24.90	44.6	3-7	21.25	36.5	3-7	33.33	27.1
4-9	55.16	35.0	4-2	33.50	7.2	4-6	25.11	44.8	4-7	22.15	36.6	4-7	35.22	27.2
5-9	55.58	34.7	5-2	33.21	7.0	5-6	25.32	45.0	5-7	23.06	36.8	5-7	37.08	27.3
6-9	55.99	34.5	6-2	32.91	6.9	6-6	25.55	45.2	6-7	23.99	36.9	6-7	38.87	27.5
7-9	56.38	34.2	7-1	32.60	6.7	7-6	25.79	45.4	7-7	24.97	37.1	7-7	40.55	27.6
8-9	56.80	34.0	8-1	32.26	6.6	8-6	26.03	45.6	8-7	26.01	37.2	8-7	42.14	27.8
9-9	57.28	33.7	9-1	31.92	6.4	9-6	26.28	45.9	9-7	27.08	37.3	9-6	43.65	28.0
10-9	57.83	33.4	10-1	31.56	6.2	10-6	26.54	46.1	10-7	28.18	37.5	10-6	45.09	28.1
11-9	58.45	33.1	11-1	31.21	6.0	11-6	26.78	46.4	11-7	29.27	37.7	11-6	46.51	28.2
12-9	59.13	32.8	12-1	30.86	5.8	12-6	27.02	46.7	12-7	30.32	37.9	12-6	47.95	28.4
13-9	59.87	32.5	13-1	30.53	5.5	13-6	27.22	47.0	13-6	31.32	38.1	13-6	49.45	28.5
14-9	60.63	32.3	14-1	30.23	5.3	14-6	27.39	47.3	14-6	32.24	38.4	14-6	51.01	28.6
15-9	61.40	32.1	15-1	29.96	5.0	15-6	27.55	47.6	15-6	33.08	38.6	15-6	52.65	28.7
16-9	62.14	31.9	16-1	29.73	4.8	16-6	27.68	47.9	16-6	33.83	38.9	16-6	54.35	28.8
17-9	62.86	31.7	17-1	29.51	4.5	17-6	27.80	48.2	17-6	34.53	39.1	17-6	56.07	29.0
18-9	63.51	31.5	18-1	29.31	4.3	18-6	27.91	48.5	18-6	35.21	39.3	18-6	57.81	29.2
19-9	64.15	31.4	19-1	29.11	4.1	19-6	28.04	48.7	19-6	35.89	39.5	19-6	59.51	29.4
20-9	64.76	31.2	20-1	28.90	3.9	20-6	28.17	49.0	20-6	36.60	39.7	20-6	61.13	29.6
21-9	65.37	31.0	21-1	28.67	3.7	21-6	28.31	49.2	21-6	37.34	39.9	21-6	62.64	29.8
22-9	66.02	30.8	22-1	28.44	3.5	22-6	28.47	49.5	22-6	38.14	40.1	22-6	64.06	30.0
23-9	66.71	30.5	23-1	28.18	3.2	23-6	28.63	49.8	23-6	38.98	40.3	23-6	65.39	30.2
24-9	67.47	30.3	24-1	27.93	3.0	24-6	28.78	50.1	24-6	39.82	40.6	24-6	66.66	30.4
25-9	68.29	30.1	25-1	27.67	2.7	25-6	28.93	50.4	25-6	40.65	40.8	25-6	67.89	30.6
26-9	69.18	29.9	26-1	27.43	2.4	26-6	29.05	50.7	26-6	41.44	41.1	26-6	69.14	30.8
27-9	70.10	29.7	27-1	27.21	2.1	27-6	29.16	51.1	27-6	42.17	41.4	27-6	70.43	30.9
28-9	71.05	29.5	28-1	27.02	1.8	28-6	29.25	51.4	28-6	42.82	41.7	28-6	71.79	31.1
29-9	71.98	29.4	29-1	26.85	1.5	29-6	29.31	51.7	29-6	43.40	42.0	29-6	73.20	31.3
30-9	72.89	29.2	30-1	26.70	1.2	30-6	29.35	52.1	30-6	43.92	42.3	30-6	74.64	31.5
31-9	73.74	29.1	31-1	26.57	0.9	31-6	29.40	52.4	31-6	44.38	42.6	31-6	76.08	31.7
32-9	74.54	29.0	32-1	26.46	0.7	32-6	29.43	52.7	32-6	44.84	42.8	32-6	77.50	31.9

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

α Ursæ Min. (Polaris).			51 Cephei (Hev.).			δ Ursæ Min.			ζ Ursæ Min.			σ Octantis.		
Mean Solar Date.	Right Ascen- sion.	Declina- tion North.	Mean Solar Date.	Right Ascen- sion.	Declina- tion North.	Mean Solar Date.	Right Ascen- sion.	Declina- tion North.	Mean Solar Date.	Right Ascen- sion.	Declina- tion North.	Mean Solar Date.	Right Ascen- sion.	Declina- tion South.
June	h m	°	June	h m	°	June	h m	°	June	h m	°	June	h m	°
	1 24	+88 47		6 55	+87 11		18 3	+86 36		19 18	+88 59		19 8	-89 14
	s	"		s	"		s	"		s	"		s	"
1.9	14.54	29.0	1.1	26.46	60.7	1.6	29.43	52.7	1.6	44.84	42.8	1.6	17.50	31.9
2.9	15.30	28.9	2.1	26.34	60.4	2.6	29.49	53.0	2.6	45.32	43.1	2.6	18.86	32.2
3.8	16.04	28.7	3.1	26.20	60.2	3.5	29.55	53.2	3.6	45.84	43.3	3.6	20.13	32.4
4.8	16.79	28.6	4.1	26.06	59.9	4.5	29.63	53.5	4.6	46.40	43.6	4.6	21.28	32.7
5.8	17.57	28.4	5.1	25.91	59.7	5.5	29.72	53.8	5.6	47.00	43.8	5.6	22.33	33.0
6.8	18.42	28.3	6.1	25.74	59.4	6.5	29.80	54.1	6.6	47.62	44.1	6.6	23.30	33.2
7.8	19.32	28.1	7.1	25.56	59.1	7.5	29.89	54.4	7.6	48.25	44.4	7.6	24.21	33.5
8.8	20.29	27.9	8.1	25.39	58.8	8.5	29.95	54.8	8.6	48.84	44.7	8.6	25.12	33.7
9.8	21.30	27.8	9.1	25.24	58.5	9.5	30.00	55.1	9.6	49.38	45.0	9.6	26.06	33.9
10.8	22.36	27.7	10.1	25.12	58.2	10.5	30.01	55.5	10.6	49.84	45.3	10.6	27.06	34.1
11.8	23.43	27.6	11.1	25.02	57.9	11.5	30.00	55.9	11.6	50.21	45.7	11.6	28.13	34.3
12.8	24.46	27.5	12.1	24.97	57.5	12.5	29.97	56.2	12.6	50.49	46.0	12.6	29.26	34.5
13.8	25.48	27.5	13.0	24.94	57.2	13.5	29.93	56.5	13.6	50.71	46.3	13.6	30.42	34.8
14.8	26.44	27.4	14.0	24.93	56.9	14.5	29.87	56.8	14.6	50.87	46.6	14.6	31.60	35.0
15.8	27.34	27.4	15.0	24.92	56.6	15.5	29.82	57.1	15.6	51.04	46.9	15.6	32.73	35.3
16.8	28.22	27.3	16.0	24.92	56.3	16.5	29.76	57.4	16.6	51.22	47.2	16.6	33.79	35.6
17.8	29.07	27.3	17.0	24.91	56.0	17.5	29.73	57.7	17.6	51.42	47.5	17.5	34.75	35.9
18.8	29.94	27.2	18.0	24.88	55.8	18.5	29.71	58.0	18.6	51.67	47.8	18.5	35.61	36.3
19.8	30.86	27.1	19.0	24.82	55.5	19.5	29.69	58.3	19.6	51.96	48.0	19.5	36.37	36.6
20.8	31.82	27.0	20.0	24.77	55.2	20.5	29.68	58.6	20.6	52.27	48.3	20.5	37.04	36.9
21.8	32.84	26.9	21.0	24.72	54.9	21.5	29.65	58.9	21.6	52.57	48.6	21.5	37.66	37.1
22.8	33.92	26.9	22.0	24.68	54.6	22.5	29.62	59.3	22.6	52.83	49.0	22.5	38.27	37.4
23.8	35.04	26.8	23.0	24.65	54.2	23.5	29.55	59.6	23.6	53.04	49.3	23.5	38.92	37.6
24.8	36.17	26.8	24.0	24.64	53.9	24.5	29.47	60.0	24.6	53.19	49.7	24.5	39.62	37.9
25.8	37.30	26.8	25.0	24.68	53.5	25.5	29.37	60.3	25.5	53.24	50.0	25.5	40.35	38.1
26.8	38.40	26.8	26.0	24.74	53.2	26.5	29.24	60.7	26.5	53.24	50.4	26.5	41.14	38.4
27.8	39.45	26.8	27.0	24.80	52.9	27.5	29.11	61.0	27.5	53.16	50.7	27.5	41.93	38.7
28.8	40.43	26.8	28.0	24.89	52.5	28.5	28.99	61.3	28.5	53.06	51.1	28.5	42.70	39.0
29.8	41.37	26.8	29.0	24.98	52.2	29.5	28.86	61.6	29.5	52.98	51.4	29.5	43.41	39.3
30.8	42.28	26.9	30.0	25.07	52.0	30.5	28.75	61.8	30.5	52.91	51.7	30.5	44.03	39.6
31.8	43.17	26.9	31.0	25.14	51.7	31.5	28.64	62.1	31.5	52.88	51.9	31.5	44.53	39.9

## CIRCUMPOLAR STARS.

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

<i>α</i> Ursæ Min. (Polaris).			51 Cephei (Hev.).			<i>δ</i> Ursæ Min.			<i>λ</i> Ursæ Min.			<i>σ</i> Octantis.		
Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion South.
July	h m 1 24	° +88 47	July	h m 6 55	° +87 11	July	h m 18 3	° +86 37	July	h m 19 18	° +88 59	July	h m 19 8	° -89 14
	s	"		s	"		s	"		s	"		s	"
1.8	43.17	26.9	1.0	25.14	51.7	1.5	28.64	2.1	1.5	52.88	51.9	1.5	44.53	39.9
2.8	44.09	26.8	2.0	25.19	51.4	2.5	28.55	2.4	2.5	52.90	52.2	2.5	44.93	40.3
3.8	45.05	26.8	3.0	25.23	51.1	3.5	28.47	2.7	3.5	52.96	52.5	3.5	45.23	40.6
4.8	46.05	26.8	4.0	25.27	50.8	4.5	28.38	3.0	4.5	53.02	52.8	4.5	45.45	40.9
5.8	47.11	26.8	5.0	25.30	50.5	5.5	28.28	3.3	5.5	53.07	53.2	5.5	45.63	41.2
6.8	48.22	26.8	5.9	25.35	50.2	6.5	28.16	3.6	6.5	53.05	53.5	6.5	45.83	41.4
7.8	49.38	26.8	6.9	25.43	49.8	7.5	28.01	4.0	7.5	52.97	53.9	7.5	46.09	41.7
8.8	50.55	26.9	7.9	25.54	49.5	8.5	27.84	4.3	8.5	52.81	54.2	8.5	46.39	42.0
9.8	51.69	26.9	8.9	25.67	49.2	9.5	27.64	4.6	9.5	52.55	54.6	9.5	46.75	42.3
10.7	52.80	27.0	9.9	25.84	48.8	10.5	27.43	4.9	10.5	52.21	54.9	10.5	47.16	42.5
11.7	53.86	27.1	10.9	26.03	48.5	11.5	27.21	5.2	11.5	51.82	55.3	11.5	47.58	42.8
12.7	54.84	27.2	11.9	26.23	48.2	12.4	26.99	5.5	12.5	51.41	55.6	12.5	47.99	43.2
13.7	55.78	27.3	12.9	26.44	47.9	13.4	26.77	5.8	13.5	51.01	55.9	13.5	48.32	43.5
14.7	56.70	27.4	13.9	26.63	47.6	14.4	26.56	6.0	14.5	50.63	56.2	14.5	48.56	43.8
15.7	57.61	27.5	14.9	26.81	47.4	15.4	26.37	6.3	15.5	50.29	56.5	15.5	48.69	44.2
16.7	58.54	27.6	15.9	26.97	47.1	16.4	26.19	6.5	16.5	50.00	56.8	16.5	48.71	44.5
17.7	59.52	27.7	16.9	27.13	46.8	17.4	26.01	6.8	17.5	49.73	57.1	17.5	48.64	44.9
18.7	60.55	27.7	17.9	27.27	46.5	18.4	25.82	7.1	18.5	49.46	57.4	18.5	48.50	45.2
19.7	61.62	27.8	18.9	27.43	46.2	19.4	25.63	7.4	19.5	49.16	57.7	19.5	48.34	45.5
20.7	62.74	27.9	19.9	27.60	45.9	20.4	25.42	7.7	20.5	48.83	58.1	20.5	48.19	45.8
21.7	63.89	28.0	20.9	27.79	45.6	21.4	25.18	8.0	21.5	48.44	58.4	21.5	48.07	46.0
22.7	65.03	28.1	21.9	28.00	45.2	22.4	24.92	8.3	22.5	47.95	58.8	22.5	48.01	46.3
23.7	66.13	28.3	22.9	28.25	44.9	23.4	24.65	8.6	23.5	47.38	59.1	23.5	47.99	46.5
24.7	67.19	28.4	23.9	28.52	44.6	24.4	24.36	8.8	24.5	46.76	59.5	24.5	48.00	46.8
25.7	68.18	28.6	24.9	28.80	44.3	25.4	24.06	9.1	25.5	46.09	59.8	25.4	47.99	47.1
26.7	69.12	28.8	25.9	29.09	44.0	26.4	23.78	9.3	26.5	45.43	60.1	26.4	47.94	47.5
27.7	70.01	28.9	26.9	29.37	43.8	27.4	23.50	9.5	27.5	44.78	60.4	27.4	47.81	47.8
28.7	70.86	29.1	27.9	29.65	43.5	28.4	23.24	9.7	28.5	44.18	60.6	28.4	47.56	48.1
29.7	71.73	29.2	28.9	29.90	43.3	29.4	23.00	9.9	29.5	43.62	60.9	29.4	47.20	48.5
30.7	72.61	29.4	29.9	30.13	43.0	30.4	22.76	10.1	30.5	43.11	61.1	30.4	46.72	48.8
31.7	73.53	29.5	30.9	30.36	42.8	31.4	22.53	10.4	31.4	42.61	61.4	31.4	46.17	49.1
32.7	74.51	29.6	31.9	30.58	42.5	32.4	22.29	10.6	32.4	42.11	61.7	32.4	45.56	49.4



CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Ursæ Min. (Polaris).		Mean Solar Date.	51 Cephei (Hæv.).		Mean Solar Date.	$\delta$ Ursæ Min.		Mean Solar Date.	$\lambda$ Ursæ Min.		Mean Solar Date.	$\sigma$ Octantis	
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion South.
Aug.	h m	° '	Aug.	h m	° '	Aug.	h m	° '	Aug.	h m	° '	Aug.	h m	° '
	1 25	+88 47		6 55	+87 11		18 3	+86 37		19 18	+89 0		19 8	-89 14
	s	"		s	"		s	"		s	"		s	"
1.7	14.51	29.6	1.9	30.82	42.2	1.4	22.29	10.6	1.4	42.11	1.7	1.4	45.56	49.4
2.7	15.54	29.7	2.9	31.07	41.9	2.4	22.03	10.9	2.4	41.57	2.0	2.4	44.95	49.7
3.7	16.60	29.9	3.9	31.35	41.6	3.4	21.75	11.1	3.4	40.99	2.4	3.4	44.37	49.9
4.7	17.67	30.1	4.9	31.66	41.3	4.4	21.44	11.4	4.4	40.32	2.7	4.4	43.85	50.2
5.7	18.74	30.3	5.9	31.99	41.0	5.4	21.11	11.7	5.4	39.57	3.0	5.4	43.38	50.4
6.7	19.76	30.5	6.9	32.36	40.7	6.4	20.77	11.9	6.4	38.73	3.4	6.4	42.98	50.7
7.7	20.73	30.7	7.9	32.74	40.4	7.4	20.42	12.1	7.4	37.82	3.7	7.4	42.59	51.0
8.7	21.64	30.9	8.9	33.11	40.2	8.4	20.06	12.3	8.4	36.89	4.0	8.4	42.20	51.3
9.7	22.48	31.2	9.9	33.48	40.0	9.4	19.70	12.5	9.4	35.96	4.2	9.4	41.76	51.6
10.7	23.29	31.4	10.9	33.85	39.8	10.4	19.36	12.6	10.4	35.04	4.5	10.4	41.26	51.9
11.7	24.07	31.6	11.9	34.19	39.6	11.4	19.03	12.8	11.4	34.16	4.7	11.4	40.64	52.2
12.7	24.86	31.9	12.9	34.52	39.3	12.4	18.71	13.0	12.4	33.33	5.0	12.4	39.91	52.5
13.7	25.69	32.1	13.9	34.84	39.1	13.4	18.41	13.1	13.4	32.54	5.2	13.4	39.08	52.8
14.7	26.54	32.3	14.9	35.16	38.9	14.4	18.10	13.3	14.4	31.76	5.5	14.4	38.18	53.1
15.6	27.46	32.5	15.9	35.48	38.6	15.4	17.79	13.5	15.4	30.98	5.7	15.4	37.24	53.4
16.6	28.41	32.7	16.9	35.83	38.4	16.3	17.46	13.7	16.4	30.16	6.0	16.4	36.29	53.6
17.6	29.40	32.9	17.9	36.20	38.1	17.3	17.11	13.9	17.4	29.28	6.3	17.4	35.39	53.8
18.6	30.38	33.1	18.9	36.60	37.8	18.3	16.74	14.1	18.4	28.34	6.6	18.4	34.53	54.1
19.6	31.33	33.4	19.9	37.03	37.6	19.3	16.35	14.3	19.4	27.31	6.9	19.4	33.72	54.3
20.6	32.23	33.7	20.9	37.45	37.3	20.3	15.96	14.5	20.4	26.22	7.2	20.4	32.96	54.5
21.6	33.07	34.0	21.9	37.90	37.1	21.3	15.56	14.7	21.4	25.10	7.5	21.4	32.19	54.7
22.6	33.84	34.3	22.9	38.35	36.9	22.3	15.16	14.8	22.4	23.95	7.7	22.4	31.40	55.0
23.6	34.55	34.6	23.9	38.78	36.7	23.3	14.77	14.9	23.4	22.82	7.9	23.4	30.55	55.3
24.6	35.21	34.8	24.8	39.20	36.6	24.3	14.40	15.0	24.4	21.73	8.1	24.4	29.60	55.6
25.6	35.87	35.1	25.8	39.59	36.4	25.3	14.03	15.1	25.4	20.69	8.3	25.4	28.55	55.8
26.6	36.54	35.4	26.8	39.98	36.2	26.3	13.69	15.2	26.4	19.71	8.5	26.4	27.38	56.1
27.6	37.24	35.6	27.8	40.35	36.0	27.3	13.36	15.4	27.4	18.75	8.7	27.4	26.13	56.4
28.6	37.98	35.8	28.8	40.72	35.8	28.3	13.01	15.5	28.4	17.80	9.0	28.4	24.81	56.6
29.6	38.76	36.1	29.8	41.10	35.6	29.3	12.66	15.6	29.4	16.85	9.2	29.3	23.47	56.8
30.6	39.58	36.3	30.8	41.52	35.4	30.3	12.30	15.8	30.4	15.85	9.4	30.3	22.16	57.0
31.6	40.41	36.6	31.8	41.95	35.2	31.3	11.92	15.9	31.4	14.77	9.7	31.3	20.90	57.2
32.6	41.25	36.9	32.8	42.41	35.0	32.3	11.50	16.1	32.4	13.62	10.0	32.3	19.72	57.3

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Ursæ Min. (Polaris).		Mean Solar Date.	51 Cephei (HEV.).		Mean Solar Date.	$\delta$ Ursæ Min.		Mean Solar Date.	$\lambda$ Ursæ Min.		Mean Solar Date.	$\sigma$ Octantis.	
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion South.
Sept.	h m	° '	Sept.	h m	° '	Sept.	h m	° '	Sept.	h m	° '	Sept.	h m	° '
	1 25	+88 47		6 55	+87 11		18 2	+86 37		19 17	+89 0		19 7	-89 14
	s	"		s	"		s	"		s	"		s	"
1.6	41.25	36.9	1.8	42.41	35.0	1.3	71.50	16.1	1.4	73.62	10.0	1.3	79.72	57.3
2.6	42.05	37.3	2.8	42.90	34.8	2.3	71.07	16.2	2.4	72.39	10.2	2.3	78.60	57.5
3.6	42.80	37.6	3.8	43.40	34.6	3.3	70.63	16.3	3.4	71.08	10.4	3.3	77.51	57.7
4.6	43.49	38.0	4.8	43.91	34.4	4.3	70.19	16.4	4.4	69.75	10.6	4.3	76.46	57.9
5.6	44.10	38.3	5.8	44.40	34.3	5.3	69.75	16.5	5.3	68.41	10.8	5.3	75.39	58.1
6.6	44.65	38.6	6.8	44.89	34.2	6.3	69.32	16.5	6.3	67.08	11.0	6.3	74.26	58.3
7.6	45.17	39.0	7.8	45.37	34.0	7.3	68.90	16.6	7.3	65.80	11.2	7.3	73.02	58.5
8.6	45.69	39.3	8.8	45.82	33.9	8.3	68.51	16.6	8.3	64.56	11.3	8.3	71.69	58.7
9.6	46.22	39.6	9.8	46.26	33.8	9.3	68.12	16.7	9.3	63.38	11.5	9.3	70.26	58.9
10.6	46.79	39.9	10.8	46.70	33.7	10.3	67.74	16.7	10.3	62.22	11.6	10.3	68.78	59.1
11.6	47.39	40.2	11.8	47.14	33.5	11.3	67.37	16.8	11.3	61.07	11.8	11.3	67.24	59.2
12.6	48.04	40.5	12.8	47.59	33.4	12.3	66.97	16.9	12.3	59.89	12.0	12.3	65.70	59.4
13.6	48.71	40.8	13.8	48.05	33.2	13.3	66.57	17.0	13.3	58.68	12.2	13.3	64.18	59.5
14.6	49.41	41.1	14.8	48.54	33.0	14.3	66.14	17.0	14.3	57.41	12.4	14.3	62.73	59.6
15.6	50.08	41.5	15.8	49.07	32.9	15.3	65.70	17.1	15.3	56.09	12.6	15.3	61.33	59.7
16.6	50.70	41.8	16.8	49.60	32.7	16.3	65.24	17.2	16.3	54.68	12.8	16.3	60.01	59.8
17.6	51.26	42.2	17.8	50.13	32.6	17.3	64.78	17.2	17.3	53.24	12.9	17.3	58.70	59.9
18.6	51.74	42.6	18.8	50.68	32.5	18.3	64.32	17.2	18.3	51.77	13.1	18.3	57.40	60.0
19.6	52.15	43.0	19.8	51.20	32.4	19.3	63.88	17.2	19.3	50.32	13.2	19.3	56.05	60.2
20.6	52.52	43.3	20.8	51.72	32.4	20.3	63.44	17.2	20.3	48.90	13.3	20.3	54.63	60.3
21.5	52.85	43.7	21.8	52.20	32.3	21.3	63.03	17.2	21.3	47.53	13.4	21.3	53.12	60.5
22.5	53.17	44.0	22.8	52.68	32.2	22.2	62.63	17.2	22.3	46.23	13.5	22.3	51.51	60.6
23.5	53.53	44.3	23.8	53.13	32.2	23.2	62.25	17.1	23.3	44.97	13.6	23.3	49.82	60.7
24.5	53.91	44.6	24.8	53.59	32.1	24.2	61.87	17.1	24.3	43.75	13.7	24.3	48.06	60.8
25.5	54.33	45.0	25.8	54.05	32.0	25.2	61.49	17.1	25.3	42.52	13.8	25.3	46.28	60.9
26.5	54.81	45.3	26.8	54.51	31.9	26.2	61.10	17.2	26.3	41.27	13.9	26.3	44.52	60.9
27.5	55.30	45.6	27.8	55.01	31.8	27.2	60.70	17.2	27.3	39.96	14.1	27.3	42.82	61.0
28.5	55.79	46.0	28.8	55.53	31.7	28.2	60.27	17.2	28.3	38.59	14.2	28.3	41.21	61.0
29.5	56.26	46.4	29.8	56.07	31.6	29.2	59.82	17.2	29.3	37.15	14.3	29.3	39.67	61.0
30.5	56.67	46.8	30.8	56.64	31.5	30.2	59.35	17.2	30.3	35.63	14.5	30.3	38.21	61.1
31.5	57.02	47.2	31.7	57.22	31.5	31.2	58.89	17.2	31.3	34.07	14.6	31.3	36.78	61.1

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

α Ursæ Min. (Polaris).			51 Cephei (Hev.).			δ Ursæ Min.			λ Ursæ Min.			σ Octantis.		
Mean Solar Date	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date	Right Ascension.	Declina- tion South.
Oct.	h m 1 25	° +88 47	Oct.	h m 6 55	° +87 11	Oct.	h m 18 2	° +86 37	Oct.	h m 19 16	° +89 0	Oct.	h m 19 6	° -89 14
	s			s			s			s			s	
1.5	57.02	47.2	1.7	57.22	31.5	1.2	58.89	17.2	1.3	94.07	14.6	1.3	96.78	61.1
2.5	57.30	47.6	2.7	57.78	31.5	2.2	58.43	17.1	2.3	92.50	14.6	2.3	95.37	61.1
3.5	57.51	48.0	3.7	58.34	31.5	3.2	57.97	17.0	3.3	90.96	14.7	3.3	93.94	61.2
4.5	57.68	48.4	4.7	58.87	31.5	4.2	57.54	16.9	4.3	89.44	14.7	4.3	92.43	61.3
5.5	57.82	48.7	5.7	59.39	31.5	5.2	57.12	16.8	5.3	87.97	14.8	5.2	90.84	61.3
6.5	57.97	49.1	6.7	59.89	31.4	6.2	56.72	16.7	6.3	86.58	14.8	6.2	89.18	61.4
7.5	58.13	49.4	7.7	60.38	31.4	7.2	56.34	16.7	7.3	85.23	14.8	7.2	87.45	61.4
8.5	58.33	49.8	8.7	60.85	31.4	8.2	55.95	16.6	8.3	83.90	14.9	8.2	85.67	61.4
9.5	58.58	50.1	9.7	61.34	31.4	9.2	55.55	16.5	9.3	82.58	14.9	9.2	83.89	61.4
10.5	58.85	50.5	10.7	61.85	31.4	10.2	55.15	16.5	10.3	81.22	15.0	10.2	82.14	61.4
11.5	59.15	50.8	11.7	62.36	31.3	11.2	54.74	16.4	11.3	79.82	15.0	11.2	80.46	61.3
12.5	59.43	51.2	12.7	62.90	31.3	12.2	54.32	16.4	12.3	78.36	15.1	12.2	78.86	61.3
13.5	59.67	51.6	13.7	63.46	31.3	13.2	53.88	16.3	13.2	76.84	15.2	13.2	77.34	61.2
14.5	59.86	52.0	14.7	64.04	31.3	14.2	53.43	16.2	14.2	75.28	15.2	14.2	75.87	61.2
15.5	59.96	52.4	15.7	64.60	31.3	15.2	52.98	16.1	15.2	73.69	15.3	15.2	74.44	61.1
16.5	59.99	52.8	16.7	65.15	31.3	16.2	52.54	16.0	16.2	72.11	15.3	16.2	72.99	61.1
17.5	59.97	53.2	17.7	65.69	31.4	17.2	52.13	15.8	17.2	70.57	15.3	17.2	71.51	61.1
18.5	59.89	53.6	18.7	66.22	31.5	18.2	51.73	15.7	18.2	69.09	15.2	18.2	69.96	61.1
19.5	59.81	54.0	19.7	66.71	31.6	19.2	51.36	15.5	19.2	67.66	15.2	19.2	68.33	61.0
20.5	59.73	54.3	20.7	67.17	31.6	20.2	51.00	15.4	20.2	66.31	15.2	20.2	66.62	61.0
21.5	59.68	54.7	21.7	67.62	31.7	21.2	50.65	15.2	21.2	65.00	15.1	21.2	64.86	60.9
22.5	59.67	55.0	22.7	68.07	31.7	22.2	50.31	15.1	22.2	63.72	15.1	22.2	63.07	60.8
23.5	59.70	55.4	23.7	68.54	31.7	23.2	49.96	15.0	23.2	62.43	15.1	23.2	61.30	60.7
24.5	59.75	55.7	24.7	69.02	31.8	24.2	49.60	14.8	24.2	61.12	15.1	24.2	59.60	60.6
25.5	59.81	56.1	25.7	69.53	31.8	25.2	49.23	14.7	25.2	59.75	15.1	25.2	57.99	60.5
26.5	59.87	56.5	26.7	70.06	31.8	26.2	48.83	14.6	26.2	58.31	15.1	26.2	56.48	60.3
27.5	59.86	56.9	27.7	70.60	31.9	27.2	48.42	14.5	27.2	56.81	15.1	27.2	55.06	60.2
28.4	59.80	57.3	28.7	71.17	31.9	28.1	48.01	14.3	28.2	55.27	15.0	28.2	53.71	60.0
29.4	59.67	57.7	29.7	71.72	32.0	29.1	47.60	14.1	29.2	53.69	15.0	29.2	52.40	59.9
30.4	59.47	58.1	30.7	72.26	32.1	30.1	47.20	13.9	30.2	52.15	14.9	30.2	51.10	59.8
31.4	59.23	58.5	31.7	72.79	32.3	31.1	46.80	13.7	31.2	50.64	14.8	31.2	49.77	59.7
32.4	58.93	58.9	32.7	73.29	32.4	32.1	46.44	13.5	32.2	49.18	14.7	32.2	48.38	59.6

## CIRCUMPOLAR STARS.

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

α Ursæ Min. (Polaris).			51 Cephei (Hev.).			δ Ursæ Min.			λ Ursæ Min.			σ Octantis.		
Mean Solar Date.	Right Ascen- sion.	Declina- tion North.	Mean Solar Date.	Right Ascen- sion.	Declina- tion North.	Mean Solar Date.	Right Ascen- sion.	Declina- tion North.	Mean Solar Date.	Right Ascen- sion.	Declina- tion North.	Mean Solar Date.	Right Ascen- sion.	Declina- tion South.
Nov.	h m 1 25	° +88 47	Nov.	h m 6 56	° +87 11	Nov.	h m 18 2	° +86 37	Nov.	h m 19 16	° +89 0	Nov.	h m 19 6	° -89 14
	s	"		s	"		s	"		s	"		s	"
1.4	58.93	58.9	1.7	13.29	32.4	1.1	46.44	13.5	1.2	49.18	14.7	1.2	48.38	59.6
2.4	58.62	59.2	2.7	13.76	32.5	2.1	46.10	13.3	2.2	47.80	14.6	2.2	46.93	59.5
3.4	58.35	59.6	3.7	14.22	32.7	3.1	45.77	13.0	3.2	46.48	14.5	3.2	45.41	59.4
4.4	58.10	59.9	4.7	14.67	32.8	4.1	45.45	12.8	4.2	45.21	14.4	4.2	43.86	59.2
5.4	57.89	60.2	5.7	15.11	32.9	5.1	45.13	12.6	5.2	43.95	14.3	5.2	42.30	59.0
6.4	57.72	60.6	6.6	15.56	33.0	6.1	44.81	12.5	6.2	42.68	14.2	6.2	40.78	58.8
7.4	57.56	60.9	7.6	16.03	33.1	7.1	44.48	12.3	7.2	41.38	14.1	7.2	39.33	58.6
8.4	57.40	61.3	8.6	16.51	33.2	8.1	44.13	12.1	8.2	40.05	14.1	8.2	37.99	58.4
9.4	57.21	61.6	9.6	17.02	33.3	9.1	43.78	11.9	9.2	38.66	14.0	9.2	36.73	58.2
10.4	56.96	62.0	10.6	17.52	33.4	10.1	43.41	11.7	10.2	37.23	13.9	10.2	35.57	58.0
11.4	56.65	62.4	11.6	18.02	33.6	11.1	43.05	11.5	11.2	35.76	13.8	11.2	34.45	57.8
12.4	56.26	62.8	12.6	18.53	33.7	12.1	42.70	11.2	12.2	34.31	13.7	12.2	33.37	57.6
13.4	55.80	63.1	13.6	19.01	33.9	13.1	42.37	10.9	13.2	32.90	13.5	13.1	32.27	57.4
14.4	55.30	63.5	14.6	19.46	34.1	14.1	42.06	10.7	14.2	31.54	13.3	14.1	31.13	57.2
15.4	54.76	63.8	15.6	19.89	34.3	15.1	41.77	10.4	15.2	30.26	13.2	15.1	29.92	57.0
16.4	54.23	64.1	16.6	20.29	34.5	16.1	41.50	10.1	16.2	29.06	13.0	16.1	28.66	56.8
17.4	53.71	64.4	17.6	20.68	34.7	17.1	41.25	9.8	17.1	27.93	12.8	17.1	27.35	56.6
18.4	53.22	64.7	18.6	21.05	34.9	18.1	41.01	9.6	18.1	26.83	12.6	18.1	26.01	56.4
19.4	52.79	65.0	19.6	21.43	35.1	19.1	40.77	9.3	19.1	25.76	12.4	19.1	24.68	56.2
20.4	52.38	65.3	20.6	21.82	35.2	20.1	40.53	9.1	20.1	24.67	12.3	20.1	23.41	55.9
21.4	52.00	65.6	21.6	22.22	35.4	21.1	40.27	8.8	21.1	23.55	12.1	21.1	22.25	55.6
22.4	51.61	65.9	22.6	22.64	35.6	22.1	40.00	8.6	22.1	22.37	12.0	22.1	21.20	55.3
23.4	51.18	66.3	23.6	23.08	35.7	23.1	39.72	8.4	23.1	21.13	11.9	23.1	20.25	55.0
24.4	50.70	66.6	24.6	23.52	35.9	24.1	39.43	8.1	24.1	19.86	11.7	24.1	19.42	54.8
25.4	50.16	67.0	25.6	23.98	36.1	25.1	39.14	7.8	25.1	18.56	11.5	25.1	18.65	54.5
26.4	49.53	67.3	26.6	24.43	36.4	26.1	38.86	7.5	26.1	17.28	11.3	26.1	17.92	54.2
27.4	48.86	67.6	27.6	24.84	36.6	27.1	38.59	7.2	27.1	16.04	11.1	27.1	17.18	54.0
28.4	48.14	67.9	28.6	25.24	36.9	28.1	38.35	6.8	28.1	14.85	10.8	28.1	16.40	53.8
29.4	47.40	68.2	29.6	25.60	37.2	29.1	38.13	6.5	29.1	13.73	10.6	29.1	15.57	53.5
30.4	46.67	68.5	30.6	25.94	37.4	30.1	37.94	6.2	30.1	12.70	10.3	30.1	14.69	53.3
31.4	45.96	68.8	31.6	26.25	37.7	31.1	37.76	5.9	31.1	11.73	10.1	31.1	13.78	53.0

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Ursæ Min. (Polaris).		Mean Solar Date.	$\delta$ Cephei (Hæv.).		Mean Solar Date.	$\delta$ Ursæ Min.		Mean Solar Date.	$\lambda$ Ursæ Min.		Mean Solar Date.	$\sigma$ Octantis.	
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion South.
Dec.	h m ° ' "	° ' "	Dec.	h m ° ' "	° ' "	Dec.	h m ° ' "	° ' "	Dec.	h m ° ' "	° ' "	Dec.	h m ° ' "	° ' "
	1 25	+88 48		6 56	+87 11		18 2	+86 36		19 15	+89 0		19 6	-89 14
	s	"		s	"		s	"		s	"		s	"
1.4	45.96	8.8	1.6	26.25	37.7	1.1	37.76	65.9	1.1	71.73	10.1	1.1	13.78	53.0
2.4	45.31	9.0	2.6	26.56	37.9	2.1	37.58	65.6	2.1	70.80	9.9	2.1	12.87	52.7
3.3	44.69	9.3	3.6	26.88	38.1	3.1	37.41	65.3	3.1	69.88	9.6	3.1	12.00	52.4
4.3	44.09	9.5	4.6	27.21	38.3	4.0	37.23	65.0	4.1	68.96	9.4	4.1	11.19	52.1
5.3	43.51	9.8	5.6	27.54	38.5	5.0	37.04	64.7	5.1	68.00	9.2	5.1	10.48	51.7
6.3	42.92	10.1	6.6	27.89	38.7	6.0	36.84	64.5	6.1	67.00	9.0	6.1	9.88	51.4
7.3	42.29	10.3	7.6	28.26	39.0	7.0	36.63	64.2	7.1	65.96	8.8	7.1	9.39	51.1
8.3	41.59	10.6	8.6	28.63	39.2	8.0	36.42	63.9	8.1	64.89	8.6	8.1	8.97	50.8
9.3	40.83	10.9	9.6	28.98	39.5	9.0	36.22	63.5	9.1	63.83	8.4	9.1	8.61	50.5
10.3	39.99	11.2	10.6	29.32	39.8	10.0	36.04	63.2	10.1	62.81	8.1	10.1	8.26	50.2
11.3	39.09	11.5	11.6	29.62	40.1	11.0	35.88	62.8	11.1	61.84	7.8	11.1	7.88	49.9
12.3	38.15	11.7	12.5	29.90	40.5	12.0	35.74	62.4	12.1	60.96	7.5	12.1	7.44	49.6
13.3	37.21	11.9	13.5	30.15	40.8	13.0	35.64	62.1	13.1	60.16	7.2	13.1	6.96	49.3
14.3	36.28	12.1	14.5	30.37	41.1	14.0	35.55	61.7	14.1	59.45	6.9	14.1	6.42	49.0
15.3	35.39	12.3	15.5	30.57	41.4	15.0	35.48	61.4	15.1	58.79	6.6	15.1	5.87	48.7
16.3	34.55	12.4	16.5	30.78	41.6	16.0	35.42	61.1	16.1	58.17	6.3	16.1	5.32	48.4
17.3	33.75	12.6	17.5	30.98	41.9	17.0	35.35	60.7	17.1	57.55	6.0	17.0	4.82	48.0
18.3	32.99	12.8	18.5	31.19	42.1	18.0	35.27	60.4	18.1	56.93	5.8	18.0	4.41	47.7
19.3	32.22	13.0	19.5	31.43	42.4	19.0	35.18	60.1	19.1	56.25	5.5	19.0	4.13	47.3
20.3	31.45	13.2	20.5	31.67	42.6	20.0	35.07	59.8	20.1	55.53	5.3	20.0	3.96	46.9
21.3	30.63	13.4	21.5	31.91	42.9	21.0	34.96	59.5	21.1	54.78	5.0	21.0	3.91	46.6
22.3	29.76	13.6	22.5	32.17	43.2	22.0	34.85	59.2	22.1	54.00	4.7	22.0	3.94	46.2
23.3	28.82	13.8	23.5	32.42	43.6	22.9	34.75	58.8	23.0	53.22	4.4	23.0	4.03	45.9
24.3	27.82	14.0	24.5	32.64	43.9	23.9	34.66	58.5	24.0	52.48	4.1	24.0	4.13	45.6
25.3	26.78	14.2	25.5	32.85	44.2	24.9	34.59	58.1	25.0	51.81	3.8	25.0	4.22	45.3
26.3	25.71	14.4	26.5	33.02	44.6	25.9	34.55	57.7	26.0	51.20	3.4	26.0	4.25	45.0
27.3	24.65	14.5	27.5	33.16	44.9	26.9	34.52	57.3	27.0	50.68	3.1	27.0	4.25	44.7
28.3	23.63	14.6	28.5	33.29	45.3	27.9	34.52	56.9	28.0	50.25	2.7	28.0	4.21	44.4
29.3	22.63	14.7	29.5	33.40	45.6	28.9	34.54	56.6	29.0	49.87	2.4	29.0	4.15	44.0
30.3	21.69	14.8	30.5	33.49	45.9	29.9	34.56	56.3	30.0	49.52	2.1	30.0	4.11	43.7
31.3	20.80	14.9	31.5	33.59	46.2	30.9	34.57	56.0	31.0	49.18	1.8	31.0	4.14	43.3
32.3	19.93	15.0	32.5	33.70	46.5	31.9	34.58	55.7	32.0	48.81	1.5	32.0	4.26	43.0

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	33 Piscium.			α Andromedæ.			β Cassiopeiæ.			22 Andromedæ.			γ Pegasi. (Algenib.)		
	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.
	h	m	°	h	m	°	h	m	°	h	m	°	h	m	°
	0	0	6 14	0	3	+28 33	0	4	+58 37	0	5	+45 32	0	8	+14 38
	s	"	"	s	"	"	s	"	"	s	"	"	s	"	"
Jan. 0.2	25.11		43.7	25.61		46.3	3.85		29.8	20.19		30.6	17.54		63.4
		.12	0.6		.15	1.0		.32	0.8		.21	0.9		.12	0.9
10.2	24.99		44.3	25.46		45.3	3.53		29.0	19.98		29.7	17.42		62.5
		.11	0.6		.14	1.3		.31	1.3		.21	1.3		.12	1.0
20.2	24.88		44.9	25.32		44.0	3.22		27.7	19.77		28.4	17.30		61.5
		.09	0.4		.13	1.4		.29	1.7		.19	1.7		.11	1.0
30.2	24.79		45.3	25.19		42.6	2.93		26.0	19.58		26.7	17.19		60.5
		.09	0.2		.11	1.6		.25	2.2		.16	2.0		.10	1.1
Feb. 9.1	24.70		45.5	25.08		41.0	2.68		23.8	19.42		24.7	17.09		59.4
		.06	0.1		.09	1.7		.20	2.5		.14	2.1		.07	1.1
19.1	24.64		45.6	24.99		39.3	2.48		21.3	19.28		22.6	17.02		58.3
		.03	0.2		.06	1.7		.15	2.6		.09	2.4		.05	1.1
29.1	24.61		45.4	24.93		37.6	2.33		18.7	19.19		20.2	16.97		57.2
		.01	0.3		.02	1.6		.07	2.8		.04	2.3		.02	0.8
Mar. 10.0	24.60		45.1	24.91		36.0	2.26		15.9	19.15		17.9	16.95		56.4
		.03	0.6		.02	1.5		.00	2.8		.01	2.3		.02	0.7
20.0	24.63		44.5	24.93		34.5	2.26		13.1	19.16		15.6	16.97		55.7
		.07	0.8		.07	1.3		.08	2.6		.06	2.1		.06	0.5
30.0	24.70		43.7	25.00		33.2	2.34		10.5	19.22		13.5	17.03		55.2
		.10	1.0		.11	1.0		.16	2.4		.13	1.9		.10	0.2
Apr. 9.0	24.80		42.7	25.11		32.2	2.50		8.1	19.35		11.6	17.13		55.0
		.11	1.3		.15	0.6		.23	2.1		.18	1.5		.14	0.1
18.9	24.94		41.4	25.26		31.6	2.73		6.0	19.53		10.1	17.27		55.1
		.18	1.5		.21	0.3		.31	1.6		.24	1.1		.18	0.4
28.9	25.12		39.9	25.47		31.3	3.04		4.4	19.75		9.0	17.45		55.5
		.22	1.7		.24	0.1		.36	1.3		.29	0.7		.22	0.7
May 8.9	25.34		38.2	25.71		31.4	3.40		3.1	20.06		8.3	17.67		56.2
		.25	1.8		.27	0.5		.42	0.7		.33	0.2		.25	1.1
18.9	25.59		36.4	25.98		31.9	3.82		2.4	20.39		8.1	17.92		57.3
		.27	2.0		.31	0.8		.46	0.1		.35	0.2		.28	1.3
28.8	25.86		34.4	26.29		32.7	4.28		2.3	20.74		8.3	18.20		58.6
		.29	2.0		.32	1.3		.49	0.3		.39	0.8		.30	1.6
June 7.8	26.15		32.4	26.61		34.0	4.77		2.6	21.13		9.1	18.50		60.2
		.31	2.0		.33	1.5		.50	0.9		.39	1.1		.31	1.8
17.8	26.46		30.4	26.94		35.5	5.27		3.5	21.52		10.2	18.81		62.0
		.30	2.0		.34	1.9		.49	1.4		.40	1.6		.31	1.9
27.7	26.76		28.4	27.28		37.4	5.76		4.9	21.92		11.8	19.12		63.9
		.30	1.8		.32	2.0		.49	1.8		.38	2.0		.31	2.1
July 7.7	27.06		26.6	27.60		39.4	6.25		6.7	22.30		13.8	19.43		66.0
		.28	1.8		.31	2.3		.45	2.2		.36	2.3		.29	2.0
17.7	27.34		24.8	27.91		41.7	6.70		8.9	22.66		16.1	19.72		68.0
		.28	1.5		.29	2.4		.42	2.6		.34	2.5		.27	2.1
27.7	27.62		23.3	28.20		44.1	7.12		11.5	23.00		18.6	19.99		70.2
		.24	1.3		.26	2.4		.37	2.9		.30	2.8		.25	2.0
Aug. 6.6	27.86		22.0	28.46		46.5	7.49		14.4	23.30		21.4	20.24		72.2
		.21	1.1		.22	2.5		.32	3.0		.25	2.9		.21	2.0
16.6	28.07		20.9	28.68		49.0	7.81		17.4	23.55		24.3	20.45		74.2
		.17	0.8		.18	2.4		.26	3.3		.21	2.9		.18	1.8
26.6	28.24		20.1	28.86		51.4	8.07		20.7	23.76		27.2	20.63		76.0
		.14	0.5		.14	2.3		.20	3.3		.17	3.0		.14	1.6
Sept. 5.6	28.38		19.6	29.00		53.7	8.27		24.0	23.93		30.2	20.77		77.6
		.09	0.2		.10	2.2		.13	3.4		.11	2.9		.10	1.5
15.5	28.47		19.4	29.10		55.9	8.40		27.4	24.04		33.1	20.87		79.1
		.06	0.0		.06	2.0		.07	3.3		.07	2.9		.07	1.2
25.5	28.53		19.4	29.16		57.9	8.47		30.7	24.11		36.0	20.94		80.3
		.02	0.2		.02	1.8		.01	3.1		.02	2.6		.02	1.0
Oct. 5.5	28.55		19.6	29.18		59.7	8.48		33.8	24.13		38.6	20.96		81.3
		.01	0.5		.01	1.6		.05	3.0		.03	2.5		.03	0.8
15.5	28.54		20.1	29.17		61.3	8.43		36.8	24.10		41.1	20.96		82.1
		.05	0.6		.05	1.3		.11	2.8		.06	2.1		.03	0.6
25.4	28.49		20.7	29.12		62.6	8.32		39.6	24.04		43.3	20.93		82.7
		.06	0.7		.07	1.0		.16	2.4		.11	1.9		.06	0.3
Nov. 4.4	28.43		21.4	29.05		63.6	8.16		42.0	23.93		45.2	20.87		83.0
		.09	0.8		.09	0.8		.20	2.1		.13	1.5		.08	0.1
14.4	28.34		22.2	28.96		64.4	7.96		44.1	23.80		46.7	20.79		83.1
		.10	0.8		.12	0.5		.24	1.6		.16	1.2		.10	0.1
24.3	28.24		23.0	28.84		64.9	7.72		45.7	23.64		47.9	20.69		83.0
		.11	0.9		.13	0.1		.28	1.1		.19	0.7		.11	0.2
Dec. 4.3	28.13		23.9	28.71		65.0	7.44		46.8	23.45		48.6	20.58		82.8
		.11	0.8		.14	0.2		.30	0.7		.20	0.3		.12	0.5
14.3	28.02		24.7	28.57		64.8	7.14		47.5	23.25		48.9	20.46		82.3
		.12	0.7		.15	0.5		.32	0.1		.21	0.2		.12	0.7
24.3	27.90		25.4	28.42		64.3	6.82		47.6	23.04		48.7	20.34		81.6
		.12	0.8		.15	0.8		.33	0.5		.21	0.6		.13	0.8
34.2	27.78		26.2	28.27		63.5	6.49		47.1	22.83		48.1	20.21		80.8

# FIXED STARS, 1904.

325

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\sigma$ Andromedæ.		$\iota$ Ceti.		44 Piscium.		$\beta$ Hydri.		12 Ceti.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.
	h m O 13	° ' " +36 15	h m O 14	° ' " - 9 21	h m O 20	° ' " + 1 24	h m O 20	° ' " -77 47	h m O 25	° ' " - 4 28
Jan. 0.2	18.99	21.6	32.05	26.7	28.86	27.6	39.60	62.5	8.34	79.3
10.2	18.82	20.6	31.92	27.3	28.74	26.9	38.69	61.5	8.22	80.0
20.2	18.65	19.4	31.81	27.8	28.63	26.2	37.84	60.0	8.10	80.6
30.2	18.49	17.9	31.70	28.1	28.52	25.5	37.07	57.9	7.99	81.0
Feb. 9.1	18.35	16.2	31.61	28.2	28.42	24.9	36.40	55.4	7.89	81.4
19.1	18.24	14.3	31.54	28.1	28.34	24.5	35.85	52.4	7.81	81.5
29.1	18.16	12.4	31.49	27.8	28.29	24.2	35.43	49.1	7.75	81.5
Mar. 10.1	18.12	10.4	31.47	27.3	28.26	24.1	35.16	45.6	7.72	81.2
20.0	18.12	8.5	31.48	26.6	28.27	24.2	35.03	41.8	7.72	80.8
30.0	18.18	6.9	31.53	25.6	28.31	24.5	35.06	38.1	7.76	80.1
Apr. 9.0	18.28	5.4	31.62	24.3	28.40	25.1	35.25	34.3	7.84	79.2
18.9	18.44	4.3	31.75	22.9	28.52	26.0	35.60	30.6	7.96	78.0
28.9	18.65	3.6	31.92	21.2	28.69	27.0	36.10	27.1	8.12	76.6
May 8.9	18.90	3.3	32.13	19.4	28.89	28.4	36.74	23.8	8.32	75.0
18.9	19.19	3.4	32.36	17.5	29.12	29.9	37.50	20.8	8.55	73.2
28.8	19.50	3.9	32.63	15.4	29.39	31.6	38.38	18.3	8.81	71.3
June 7.8	19.84	4.8	32.92	13.4	29.68	33.5	39.36	16.1	9.09	69.3
17.8	20.20	6.1	33.22	11.3	29.98	35.4	40.40	14.5	9.39	67.3
27.8	20.55	7.8	33.53	9.3	30.28	37.4	41.48	13.4	9.70	65.3
July 7.7	20.90	9.8	33.84	7.5	30.58	39.4	42.58	12.8	10.00	63.4
17.7	21.24	12.0	34.13	5.8	30.88	41.3	43.66	12.8	10.30	61.6
27.7	21.54	14.5	34.41	4.3	31.15	43.1	44.70	13.4	10.57	59.9
Aug. 6.6	21.82	17.0	34.66	3.1	31.40	44.7	45.66	14.6	10.83	58.5
16.6	22.06	19.7	34.88	2.1	31.62	46.1	46.51	16.2	11.05	57.3
26.6	22.27	22.3	35.06	1.5	31.80	47.3	47.23	18.4	11.24	56.4
Sept. 5.6	22.43	24.9	35.21	1.1	31.96	48.2	47.79	20.9	11.40	55.8
15.5	22.54	27.4	35.32	1.1	32.07	48.9	48.18	23.7	11.52	55.4
25.5	22.62	29.8	35.39	1.3	32.14	49.4	48.39	26.8	11.60	55.3
Oct. 5.5	22.65	32.1	35.42	1.7	32.19	49.6	48.40	29.1	11.64	55.5
15.5	22.64	34.1	35.42	2.3	32.19	49.6	48.23	33.0	11.66	55.8
25.4	22.60	35.8	35.40	3.1	32.18	49.4	47.88	35.9	11.64	56.4
Nov. 4.4	22.53	37.3	35.34	4.0	32.13	49.0	47.36	38.6	11.60	57.0
14.4	22.43	38.5	35.26	5.0	32.06	48.5	46.71	40.9	11.53	57.8
24.3	22.31	39.3	35.17	5.9	31.98	47.9	45.94	42.7	11.44	58.6
Dec. 4.3	22.16	39.8	35.06	6.9	31.88	47.3	45.08	44.0	11.35	59.5
14.3	22.00	39.9	34.95	7.8	31.77	46.5	44.17	44.7	11.24	60.3
24.3	21.84	39.6	34.83	8.6	31.65	45.8	43.24	44.8	11.12	61.1
34.2	21.66	38.9	34.70	9.3	31.53	45.0	42.32	44.2	11.00	61.9

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\pi$ Andromedæ.			$\alpha$ Cassiopeiæ.			$\beta$ Ceti.			$\gamma$ Cassiopeiæ.			$\delta$ Cassiopeiæ.		
	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.
	h m 0 31	° ' " +33 11		h m 0 35	° ' " +56 0		h m 0 38	° ' " -18 30		h m 0 39	° ' " +74 27		h m 0 39	° ' " +47 45	
	s	"		s	"		s	"		s	"		s	"	
Jan. 0.3	45.53	.16	36.5	4.31	54.4	46.14	57.2	20.35	66.3	23.15	45.6				
10.2	45.37	.16	35.7	4.01	53.9	46.01	57.8	19.62	66.2	22.92	45.0				
20.2	45.20	.17	34.7	3.72	53.0	45.88	58.1	18.90	65.6	22.69	44.1				
30.2	45.04	.16	33.3	3.44	51.6	45.75	58.2	18.21	64.4	22.47	42.7				
Feb. 9.1	44.90	.12	31.8	3.18	49.7	45.64	57.9	17.57	62.6	22.26	41.0				
19.1	44.78	.09	30.1	2.95	47.6	45.54	57.5	17.02	60.4	22.09	39.0				
29.1	44.69	.06	28.4	2.78	45.1	45.46	56.7	16.58	57.7	21.95	36.8				
Mar. 10.1	44.63	.06	26.6	2.66	42.6	45.42	55.7	16.27	54.9	21.86	34.5				
20.0	44.62	.03	24.9	2.61	40.0	45.40	54.4	16.10	51.8	21.82	32.2				
30.0	44.65	.08	23.4	2.64	37.4	45.43	52.9	16.08	48.8	21.83	30.0				
Apr. 9.0	44.73	.13	22.1	2.73	35.0	45.49	51.1	16.22	45.9	21.92	28.0				
19.0	44.86	.19	21.1	2.90	32.9	45.60	49.2	16.51	43.1	22.06	26.2				
28.9	45.05	.22	20.5	3.15	31.2	45.74	47.1	16.94	40.7	22.27	24.8				
May 8.9	45.27	.27	20.2	3.46	29.8	45.93	44.8	17.50	38.7	22.53	23.8				
18.9	45.54	.30	20.3	3.82	28.9	46.16	42.5	18.17	37.1	22.84	23.2				
28.8	45.84	.33	20.8	4.23	28.5	46.42	40.2	18.93	36.0	23.19	23.0				
June 7.8	46.17	.34	21.7	4.68	28.6	46.70	37.9	19.76	35.5	23.57	23.4				
17.8	46.51	.35	23.0	5.14	29.2	47.00	35.7	20.63	35.5	23.98	24.2				
27.8	46.86	.34	24.5	5.62	30.3	47.32	33.7	21.52	36.1	24.38	25.4				
July 7.7	47.20	.33	26.4	6.09	31.8	47.63	31.8	22.40	37.2	24.79	27.0				
17.7	47.53	.32	28.5	6.54	33.7	47.94	30.2	23.25	38.8	25.19	29.0				
27.7	47.85	.28	30.8	6.97	36.0	48.23	28.9	24.05	40.9	25.56	31.2				
Aug. 6.7	48.13	.25	33.2	7.36	38.6	48.51	28.0	24.78	43.3	25.90	33.7				
16.6	48.38	.22	35.6	7.70	41.4	48.75	27.3	25.44	46.2	26.21	36.4				
26.6	48.60	.18	38.1	8.00	44.5	48.96	27.1	25.99	49.3	26.47	39.3				
Sept. 5.6	48.78	.14	40.5	8.24	47.6	49.14	27.2	26.45	52.6	26.68	42.2				
15.5	48.92	.09	42.9	8.42	50.8	49.27	27.6	26.80	56.2	26.85	45.1				
25.5	49.01	.06	45.1	8.55	53.9	49.37	28.3	27.03	59.8	26.97	47.9				
Oct. 5.5	49.07	.02	47.2	8.62	57.0	49.43	29.3	27.14	63.4	27.05	50.7				
15.5	49.09	.02	49.1	8.63	60.0	49.45	30.4	27.13	66.9	27.07	53.3				
25.4	49.07	.05	50.7	8.59	62.8	49.44	31.8	27.01	70.3	27.05	55.7				
Nov. 4.4	49.02	.07	52.1	8.50	65.3	49.40	33.2	26.77	73.6	26.99	57.8				
14.4	48.95	.10	53.2	8.36	67.5	49.33	34.6	26.42	76.4	26.90	59.7				
24.4	48.85	.13	54.0	8.18	69.2	49.24	35.9	25.97	78.9	26.76	61.2				
Dec. 4.3	48.72	.14	54.4	7.96	70.6	49.14	37.2	25.42	81.0	26.60	62.3				
14.3	48.58	.15	54.6	7.71	71.5	49.02	38.3	24.80	82.5	26.41	63.0				
24.3	48.43	.16	54.4	7.44	71.9	48.90	39.2	24.12	83.5	26.20	63.2				
34.2	48.27		53.8	7.14	71.8	48.77	39.9	23.41	83.8	25.97	63.0				



# FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

327

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\delta$ Piscium.		$\gamma$ Cassiopeizæ.		$\mu$ Andromedæ.		43 Cephei (H.).		$\epsilon$ Piscium.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 0 43	+ 7 3	h m 0 50	+60 11	h m 0 51	+37 58	h m 0 55	+85 44	h m 0 57	+ 7 22
	s	"	s	"	s	"	s	"	s	"
Jan. 0.3	42.24	45.4	55.88	64.4	25.99	53.1	41.58	50.7	57.87	23.4
10.2	42.11	44.7 0.7	55.54 .34	64.2 0.2	25.81 .18	52.5 0.6	38.74 2.84	51.2 0.5	57.74 .13	22.6 0.8
20.2	41.99	43.9 0.8	55.20 .34	63.5 0.7	25.63 .18	51.6 1.2	35.88 2.75	51.0 0.8	57.62 .12	21.9 0.8
30.2	41.86	43.1 0.7	54.86 .32	62.3 1.7	25.45 .17	50.4 1.5	33.10 2.58	50.2 1.5	57.49 .12	21.1 0.7
Feb. 9.2	41.75	42.4 0.7	54.54 .28	60.6 2.1	25.28 .15	48.9 1.6	30.52 2.29	48.7 2.0	57.37 .11	20.4 0.7
19.1	41.66	41.7 0.6	54.26 .23	58.5 2.3	25.13 .12	47.3 1.9	28.23 1.90	46.7 2.4	57.26 .09	19.7 0.5
29.1	41.58	41.1 0.4	54.03 .16	56.2 2.6	25.01 .09	45.4 1.8	26.33 1.45	44.3 2.8	57.17 .06	19.2 0.4
Mar. 10.1	41.53	40.7 0.2	53.87 .09	53.6 2.7	24.92 .04	43.6 1.9	24.88 0.93	41.5 3.1	57.11 .03	18.8 0.3
20.0	41.51	40.5 0.0	53.78 .01	50.9 2.7	24.88 .01	41.7 1.8	23.95 0.39	38.4 3.1	57.08 .00	18.5 0.0
30.0	41.54	40.5 0.2	53.77 .07	48.2 2.5	24.89 .06	39.9 1.5	23.56 0.18	35.3 3.1	57.08 .05	18.5 0.2
Apr. 9.0	41.60	40.7 0.5	53.84 .16	45.7 2.3	24.95 .12	38.4 1.3	23.74 0.71	32.2 3.1	57.13 .09	18.7 0.5
19.0	41.70	41.2 0.7	54.00 .24	43.4 2.0	25.07 .17	37.1 1.0	24.45 1.23	29.1 2.7	57.22 .14	19.2 0.7
28.9	41.85	41.9 1.1	54.24 .32	41.4 1.7	25.24 .22	36.1 0.6	25.68 1.70	26.4 2.5	57.36 .17	19.9 0.9
May 8.9	42.04	43.0 1.2	54.56 .38	39.7 1.2	25.46 .26	35.5 0.3	27.38 2.10	23.9 2.0	57.53 .21	20.8 1.2
18.9	42.26	44.2 1.5	54.94 .44	38.5 0.7	25.72 .30	35.2 0.2	29.48 2.43	21.9 1.6	57.74 .25	22.0 1.5
28.9	42.51	45.7 1.7	55.38 .48	37.8 0.2	26.02 .34	35.4 0.6	31.91 2.69	20.3 1.0	57.99 .27	23.5 1.6
June 7.8	42.79	47.4 1.8	55.86 .50	37.6 0.3	26.36 .35	36.0 0.9	34.60 2.85	19.3 1.5	58.26 .29	25.1 1.8
17.8	43.09	49.2 1.9	56.36 .52	37.9 0.8	26.71 .36	36.9 1.4	37.45 2.95	18.8 0.1	58.55 .31	26.9 1.9
27.8	43.39	51.1 1.9	56.88 .53	38.7 1.2	27.07 .37	38.3 1.6	40.40 2.96	18.9 0.6	58.86 .30	28.8 1.9
July 7.7	43.70	53.0 2.0	57.41 .51	39.9 1.7	27.44 .35	39.9 1.9	43.36 2.90	19.5 1.2	59.16 .30	30.7 1.9
17.7	44.00	55.0 1.9	57.92 .48	41.6 2.1	27.79 .34	41.8 2.2	46.26 2.78	20.7 1.6	59.46 .29	32.6 1.9
27.7	44.28	56.9 1.7	58.40 .45	43.7 2.4	28.13 .31	44.0 2.3	49.04 2.58	22.3 2.2	59.75 .27	34.5 1.7
Aug. 6.7	44.55	58.6 1.7	58.85 .40	46.1 2.7	28.44 .28	46.3 2.5	51.62 2.34	24.5 2.5	60.02 .25	36.2 1.7
16.6	44.78	60.3 1.4	59.25 .35	48.8 3.0	28.72 .25	48.8 2.5	53.96 2.05	27.0 3.0	60.27 .21	37.9 1.4
26.6	44.99	61.7 1.2	59.60 .29	51.8 3.1	28.97 .21	51.3 2.5	56.01 1.72	30.0 3.2	60.48 .19	39.3 1.3
Sept. 5.6	45.16	62.9 1.0	59.89 .24	54.9 3.2	29.18 .16	53.8 2.5	57.73 1.34	33.2 3.5	60.67 .15	40.6 1.0
15.5	45.30	63.9 0.8	60.13 .17	58.1 3.3	29.34 .13	56.3 2.5	59.07 0.95	36.7 3.6	60.82 .11	41.6 0.8
25.5	45.40	64.7 0.6	60.30 .11	61.4 3.2	29.47 .08	58.8 2.2	60.02 0.53	40.3 3.7	60.93 .08	42.4 0.5
Oct. 5.5	45.46	65.3 0.3	60.41 .04	64.6 3.1	29.55 .05	61.0 2.2	60.55 0.09	44.0 3.8	61.01 .05	42.9 0.4
15.5	45.50	65.6 0.1	60.45 .02	67.7 3.0	29.60 .01	63.2 1.9	60.64 0.35	47.8 3.7	61.06 .02	43.3 0.1
25.5	45.50	65.7 0.0	60.43 .07	70.7 2.7	29.61 .03	65.1 1.7	60.29 0.81	51.5 3.5	61.08 .02	43.4 0.0
Nov. 4.4	45.47	65.7 0.3	60.36 .14	73.4 2.5	29.58 .06	66.8 1.4	59.48 1.24	55.0 3.4	61.06 .03	43.4 0.3
14.4	45.43	65.4 0.3	60.22 .19	75.9 2.1	29.52 .09	68.2 1.1	58.24 1.66	58.4 2.9	61.03 .06	43.1 0.3
24.4	45.36	65.1 0.5	60.03 .23	78.0 1.7	29.43 .12	69.3 0.8	56.58 2.03	61.3 2.6	60.97 .08	42.8 0.5
Dec. 4.3	45.27	64.6 0.6	59.80 .28	79.7 1.2	29.31 .14	70.1 0.4	54.55 2.37	63.9 2.0	60.89 .10	42.3 0.6
14.3	45.17	64.0 0.7	59.52 .31	80.9 0.7	29.17 .16	70.5 0.1	52.18 2.62	65.9 1.5	60.79 .11	41.7 0.6
24.3	45.06	63.3 0.7	59.21 .33	81.6 0.1	29.01 .18	70.6 0.3	49.56 2.81	67.4 0.8	60.68 .12	41.1 0.7
34.3	44.93	62.6	58.88	81.7	28.83	70.3	46.75	68.2	60.56	40.4

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Andromedæ.		κ Tucanæ.		f Piscium.		θ Ceti.		38 Cassiopeiæ.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.
	h m I 4	° ' +35 6	h m I 12	° ' -69 22	h m I 12	° ' + 3 6	h m I 19	° ' -8 40	h m I 24	° ' +69 46
	s	"	s	"	s	"	s	"	s	"
Jan. 0.3	21.94 -17	50.3 0.5	29.81 -55	92.1 0.1	51.11 -13	29.6 0.8	13.70 -12	50.2 0.8	7.09 -51	29.8 0.5
10.2	21.77 -17	49.8 0.8	29.26 -54	92.0 0.6	50.98 -13	28.8 0.7	13.58 -14	51.0 0.7	6.58 -54	30.3 0.1
20.2	21.60 -18	49.0 1.1	28.72 -53	91.4 1.2	50.85 -13	28.1 0.6	13.44 -13	51.7 0.4	6.04 -54	30.2 0.7
30.2	21.42 -17	47.9 1.3	28.19 -49	90.2 1.7	50.72 -12	27.5 0.6	13.31 -13	52.1 0.3	5.50 -53	29.5 1.3
Feb. 9.2	21.25 -15	46.6 1.6	27.70 -44	88.5 2.3	50.60 -12	26.9 0.5	13.18 -12	52.4 0.0	4.97 -48	28.2 1.7
	19.1 -12	21.10 1.6	27.26 -38	86.2 2.6	50.48 -10	26.4 0.3	13.06 -11	52.4 0.2	4.49 -41	26.5 2.2
	29.1 -10	20.98 1.7	26.88 -30	83.6 3.1	50.38 -07	26.1 0.2	12.95 -08	52.2 0.4	4.08 -34	24.3 2.5
Mar. 10.1	20.88 -05	41.7 1.7	26.58 -22	80.5 3.3	50.31 -05	25.9 0.0	12.87 -05	51.8 0.7	3.74 -23	21.8 2.7
20.0	20.83 -00	40.0 1.6	26.36 -13	77.2 3.5	50.26 -00	25.9 0.2	12.82 02	51.1 0.9	3.51 -13	19.1 2.9
30.0	20.83 -04	38.4 1.4	26.23 -04	73.7 3.7	50.26 -03	26.1 0.5	12.80 -02	50.2 1.1	3.38 -00	16.2 2.8
Apr. 9.0	20.87 -10	37.0 1.2	26.19 -07	70.0 3.7	50.29 -07	26.6 0.7	12.82 -06	49.1 1.4	3.38 -12	13.4 2.7
19.0	20.97 -15	35.8 0.9	26.26 -17	66.3 3.7	50.36 -12	27.3 0.9	12.88 -11	47.7 1.6	3.50 -24	10.7 2.5
28.9	21.12 -20	34.9 0.5	26.43 -26	62.6 3.5	50.48 -16	28.2 1.2	12.99 -15	46.1 1.8	3.74 -36	8.2 2.3
May 8.9	21.32 -25	34.4 0.2	26.69 -36	59.1 3.4	50.64 -20	29.4 1.4	13.14 -19	44.3 1.9	4.10 -45	5.9 1.8
18.9	21.57 -29	34.2 0.2	27.05 -44	55.7 3.1	50.84 -23	30.8 1.6	13.33 -23	42.4 2.1	4.55 -55	4.1 1.4
	28.9 -31	21.86 0.5	27.49 -53	52.6 2.8	51.07 -26	32.4 1.7	13.56 -26	40.3 2.1	5.10 -61	2.7 0.9
June 7.8	22.17 -34	34.9 1.0	28.02 -58	49.8 2.4	51.33 -29	34.1 1.8	13.82 -28	38.2 2.1	5.71 -67	1.8 0.4
17.8	22.51 -35	35.9 1.3	28.60 -63	47.4 1.9	51.62 -29	35.9 1.9	14.10 -29	36.1 2.1	6.38 -70	1.4 0.1
27.8	22.86 -36	37.2 1.5	29.23 -67	45.5 1.4	51.91 -31	37.8 2.0	14.39 -30	34.0 2.0	7.08 -72	1.5 0.6
July 7.8	23.22 -34	38.7 1.9	29.90 -68	44.1 0.9	52.22 -30	39.8 1.9	14.69 -31	32.0 1.8	7.80 -72	2.1 1.1
	17.7 -34	23.56 2.0	30.58 -67	43.2 0.2	52.52 -29	41.7 1.7	15.00 -29	30.2 1.6	8.52 -70	3.2 1.6
	27.7 -31	23.90 2.2	31.25 -64	43.0 0.3	52.81 -28	43.4 1.7	15.29 -28	28.6 1.4	9.22 -66	4.8 2.0
Aug. 6.7	24.21 -29	44.8 2.3	31.89 -60	43.3 0.9	53.09 -25	45.1 1.5	15.57 -26	27.2 1.1	9.88 -61	6.8 2.3
16.6	24.50 -25	47.1 2.4	32.49 -54	44.2 1.4	53.34 -22	46.6 1.2	15.83 -23	26.1 0.8	10.49 -55	9.1 2.7
26.6	24.75 -22	49.5 2.4	33.03 -45	45.6 2.0	53.56 -20	47.8 1.1	16.06 -20	25.3 0.5	11.04 -49	11.8 3.0
Sept. 5.6	24.97 -17	51.9 2.3	33.48 -37	47.6 2.4	53.76 -16	48.9 0.7	16.26 -17	24.8 0.2	11.53 -40	14.8 3.2
15.6	25.14 -14	54.2 2.2	33.85 -26	50.0 2.7	53.92 -13	49.6 0.6	16.43 -13	24.6 0.2	11.93 -33	18.0 3.3
25.5	25.28 -10	56.4 2.4	34.11 -16	52.7 3.0	54.05 -09	50.2 0.3	16.56 -10	24.8 0.4	12.26 -24	21.3 3.4
Oct. 5.5	25.38 -06	58.6 1.9	34.27 -04	55.7 3.1	54.14 -06	50.5 0.0	16.66 -07	25.2 0.7	12.50 -15	24.7 3.4
15.5	25.44 -03	60.5 1.8	34.31 -06	58.8 3.1	54.20 -04	50.5 0.1	16.73 -03	25.9 0.8	12.65 -05	28.1 3.3
	25.5 -01	25.47 1.6	34.25 -17	61.9 3.0	54.24 -00	50.4 0.3	16.76 -00	26.7 1.0	12.70 -03	31.4 3.2
Nov. 4.4	25.46 -04	63.9 1.3	34.08 -27	64.9 2.8	54.24 -03	50.1 0.5	16.76 -02	27.7 1.1	12.67 -13	34.6 3.0
14.4	25.42 -07	65.2 1.0	33.81 -35	67.7 2.5	54.21 -04	49.6 0.5	16.74 -05	28.8 1.1	12.54 -21	37.6 2.7
24.4	25.35 -10	66.2 0.7	33.46 -43	70.2 2.0	54.17 -07	49.1 0.7	16.69 -07	29.9 1.1	12.33 -30	40.3 2.3
Dec. 4.3	25.25 -13	66.9 0.4	33.03 -48	72.2 1.5	54.10 -09	48.4 0.7	16.62 -09	31.0 1.1	12.03 -38	42.6 1.9
	14.3 -14	25.12 0.1	32.55 -51	73.7 1.0	54.01 -10	47.7 0.7	16.53 -10	32.1 1.0	11.65 -44	44.5 1.4
	24.3 -16	24.98 0.2	32.04 -54	74.7 0.3	53.91 -12	47.0 0.8	16.43 -12	33.1 0.9	11.21 -49	45.9 0.8
	34.3	24.82	31.50	75.0	53.79	46.2	16.31	34.0	10.72	46.7

# FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

329

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	♍ Piscium.			♑ Andromedæ.			♊ Piscium.			♎ Eridani. (Achernar.)			♐ Piscium.		
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion South.		Right Ascension.	Declina- tion North.	
	h m 1 26	° ' " +14 50		h m 1 31	° ' " +40 55		h m 1 32	° ' " +11 38		h m 1 34	° ' " -57 43		h m 1 36	° ' " + 4 59	
	s	"		s	"		s	"		s	"		s	"	
Jan. 0.3	21.21 <sup>.13</sup>	64.5 <sup>0.7</sup>		10.57 <sup>.18</sup>	40.2 <sup>0.2</sup>		0.99 <sup>.12</sup>	61.4 <sup>0.7</sup>		8.12 <sup>.33</sup>	48.9 <sup>0.5</sup>		26.54 <sup>.12</sup>	63.9 <sup>0.7</sup>	
10.3	21.08 <sup>.14</sup>	63.8 <sup>0.7</sup>		10.39 <sup>.20</sup>	40.0 <sup>0.5</sup>		0.87 <sup>.14</sup>	60.7 <sup>0.7</sup>		7.79 <sup>.34</sup>	49.4 <sup>0.0</sup>		26.42 <sup>.13</sup>	63.2 <sup>0.7</sup>	
20.2	20.94 <sup>.14</sup>	63.1 <sup>0.8</sup>		10.19 <sup>.21</sup>	39.5 <sup>0.9</sup>		0.73 <sup>.14</sup>	60.0 <sup>0.7</sup>		7.45 <sup>.34</sup>	49.4 <sup>0.6</sup>		26.29 <sup>.14</sup>	62.5 <sup>0.7</sup>	
30.2	20.80 <sup>.14</sup>	62.3 <sup>0.8</sup>		9.98 <sup>.20</sup>	38.6 <sup>1.2</sup>		0.59 <sup>.14</sup>	59.3 <sup>0.8</sup>		7.11 <sup>.32</sup>	48.8 <sup>1.2</sup>		26.15 <sup>.14</sup>	61.8 <sup>0.6</sup>	
Feb. 9.2	20.66 <sup>.13</sup>	61.5 <sup>0.9</sup>		9.78 <sup>.19</sup>	37.4 <sup>1.4</sup>		0.45 <sup>.13</sup>	58.5 <sup>0.7</sup>		6.79 <sup>.29</sup>	47.6 <sup>1.7</sup>		26.01 <sup>.13</sup>	61.2 <sup>0.5</sup>	
19.2	20.53 <sup>.11</sup>	60.6 <sup>0.8</sup>		9.59 <sup>.17</sup>	36.0 <sup>1.7</sup>		0.32 <sup>.11</sup>	57.8 <sup>0.7</sup>		6.50 <sup>.27</sup>	45.9 <sup>2.1</sup>		25.88 <sup>.11</sup>	60.7 <sup>0.4</sup>	
29.1	20.42 <sup>.09</sup>	59.8 <sup>0.7</sup>		9.42 <sup>.13</sup>	34.3 <sup>1.8</sup>		0.21 <sup>.10</sup>	57.1 <sup>0.6</sup>		6.23 <sup>.22</sup>	43.8 <sup>2.5</sup>		25.77 <sup>.10</sup>	60.3 <sup>0.3</sup>	
Mar. 10.1	20.33 <sup>.06</sup>	59.1 <sup>0.6</sup>		9.29 <sup>.09</sup>	32.5 <sup>1.8</sup>		0.11 <sup>.06</sup>	56.5 <sup>0.4</sup>		6.01 <sup>.17</sup>	41.3 <sup>2.8</sup>		25.67 <sup>.06</sup>	60.0 <sup>0.1</sup>	
20.1	20.27 <sup>.03</sup>	58.5 <sup>0.5</sup>		9.20 <sup>.04</sup>	30.7 <sup>1.9</sup>		0.05 <sup>.03</sup>	56.1 <sup>0.3</sup>		5.84 <sup>.11</sup>	38.5 <sup>3.2</sup>		25.61 <sup>.03</sup>	59.9 <sup>0.1</sup>	
30.1	20.24 <sup>.02</sup>	58.0 <sup>0.3</sup>		9.16 <sup>.01</sup>	28.8 <sup>1.7</sup>		0.02 <sup>.02</sup>	55.8 <sup>0.1</sup>		5.73 <sup>.05</sup>	35.3 <sup>3.3</sup>		25.58 <sup>.00</sup>	60.0 <sup>0.3</sup>	
Apr. 9.0	20.26 <sup>.07</sup>	57.7 <sup>0.0</sup>		9.17 <sup>.07</sup>	27.1 <sup>1.5</sup>		0.04 <sup>.06</sup>	55.7 <sup>0.1</sup>		5.68 <sup>.02</sup>	32.0 <sup>3.5</sup>		25.58 <sup>.06</sup>	60.3 <sup>0.6</sup>	
19.0	20.33 <sup>.11</sup>	57.7 <sup>0.2</sup>		9.24 <sup>.13</sup>	25.6 <sup>1.3</sup>		0.10 <sup>.10</sup>	55.8 <sup>0.4</sup>		5.70 <sup>.09</sup>	28.5 <sup>3.6</sup>		25.64 <sup>.09</sup>	60.9 <sup>0.8</sup>	
29.0	20.44 <sup>.16</sup>	57.9 <sup>0.5</sup>		9.37 <sup>.18</sup>	24.3 <sup>1.0</sup>		0.20 <sup>.14</sup>	56.2 <sup>0.7</sup>		5.79 <sup>.16</sup>	24.9 <sup>3.5</sup>		25.73 <sup>.14</sup>	61.7 <sup>1.0</sup>	
May 8.9	20.60 <sup>.19</sup>	58.4 <sup>0.8</sup>		9.55 <sup>.24</sup>	23.3 <sup>0.6</sup>		0.34 <sup>.19</sup>	56.9 <sup>0.9</sup>		5.95 <sup>.23</sup>	21.4 <sup>3.4</sup>		25.87 <sup>.18</sup>	62.7 <sup>1.3</sup>	
18.9	20.79 <sup>.23</sup>	59.2 <sup>1.0</sup>		9.79 <sup>.28</sup>	22.7 <sup>0.3</sup>		0.53 <sup>.23</sup>	57.8 <sup>1.2</sup>		6.18 <sup>.29</sup>	18.0 <sup>3.3</sup>		26.05 <sup>.22</sup>	64.0 <sup>1.4</sup>	
28.9	21.02 <sup>.27</sup>	60.2 <sup>1.2</sup>		10.07 <sup>.32</sup>	22.4 <sup>0.1</sup>		0.76 <sup>.26</sup>	59.0 <sup>1.3</sup>		6.47 <sup>.35</sup>	14.7 <sup>3.0</sup>		26.27 <sup>.25</sup>	65.4 <sup>1.6</sup>	
June 7.9	21.29 <sup>.29</sup>	61.4 <sup>1.5</sup>		10.39 <sup>.35</sup>	22.5 <sup>0.5</sup>		1.02 <sup>.28</sup>	60.3 <sup>1.6</sup>		6.82 <sup>.40</sup>	11.7 <sup>2.7</sup>		26.52 <sup>.27</sup>	67.0 <sup>1.8</sup>	
17.9	21.58 <sup>.30</sup>	62.9 <sup>1.6</sup>		10.74 <sup>.36</sup>	23.0 <sup>0.9</sup>		1.30 <sup>.30</sup>	61.9 <sup>1.7</sup>		7.22 <sup>.43</sup>	9.0 <sup>2.3</sup>		26.79 <sup>.30</sup>	68.8 <sup>1.8</sup>	
27.9	21.88 <sup>.31</sup>	64.5 <sup>1.8</sup>		11.10 <sup>.38</sup>	23.9 <sup>1.2</sup>		1.60 <sup>.30</sup>	63.6 <sup>1.8</sup>		7.65 <sup>.46</sup>	6.7 <sup>1.8</sup>		27.09 <sup>.30</sup>	70.6 <sup>1.9</sup>	
July 7.8	22.19 <sup>.31</sup>	66.3 <sup>1.8</sup>		11.48 <sup>.38</sup>	25.1 <sup>1.5</sup>		1.90 <sup>.31</sup>	65.4 <sup>1.8</sup>		8.11 <sup>.47</sup>	4.9 <sup>1.4</sup>		27.39 <sup>.30</sup>	72.5 <sup>1.8</sup>	
17.7	22.50 <sup>.31</sup>	68.1 <sup>1.9</sup>		11.86 <sup>.36</sup>	26.6 <sup>1.8</sup>		2.21 <sup>.30</sup>	67.2 <sup>1.8</sup>		8.58 <sup>.48</sup>	3.5 <sup>0.8</sup>		27.69 <sup>.30</sup>	74.3 <sup>1.8</sup>	
27.7	22.81 <sup>.28</sup>	70.0 <sup>1.8</sup>		12.22 <sup>.35</sup>	28.4 <sup>2.1</sup>		2.51 <sup>.29</sup>	69.0 <sup>1.8</sup>		9.06 <sup>.46</sup>	2.7 <sup>0.2</sup>		27.99 <sup>.28</sup>	76.1 <sup>1.7</sup>	
Aug. 6.7	23.09 <sup>.27</sup>	71.8 <sup>1.8</sup>		12.57 <sup>.32</sup>	30.5 <sup>2.2</sup>		2.80 <sup>.26</sup>	70.8 <sup>1.7</sup>		9.52 <sup>.43</sup>	2.5 <sup>0.4</sup>		28.27 <sup>.27</sup>	77.8 <sup>1.5</sup>	
16.7	23.36 <sup>.24</sup>	73.6 <sup>1.7</sup>		12.89 <sup>.29</sup>	32.7 <sup>2.3</sup>		3.06 <sup>.24</sup>	72.5 <sup>1.5</sup>		9.95 <sup>.39</sup>	2.9 <sup>0.9</sup>		28.54 <sup>.24</sup>	79.3 <sup>1.3</sup>	
26.6	23.60 <sup>.21</sup>	75.3 <sup>1.5</sup>		13.18 <sup>.26</sup>	35.0 <sup>2.4</sup>		3.30 <sup>.22</sup>	74.0 <sup>1.4</sup>		10.34 <sup>.35</sup>	3.8 <sup>1.4</sup>		28.78 <sup>.21</sup>	80.6 <sup>1.1</sup>	
Sept. 5.6	23.81 <sup>.18</sup>	76.8 <sup>1.3</sup>		13.44 <sup>.22</sup>	37.4 <sup>2.4</sup>		3.52 <sup>.18</sup>	75.4 <sup>1.2</sup>		10.69 <sup>.29</sup>	5.2 <sup>1.9</sup>		28.99 <sup>.18</sup>	81.7 <sup>0.9</sup>	
15.6	23.99 <sup>.14</sup>	78.1 <sup>1.2</sup>		13.66 <sup>.18</sup>	39.8 <sup>2.4</sup>		3.70 <sup>.15</sup>	76.6 <sup>1.0</sup>		10.98 <sup>.22</sup>	7.1 <sup>2.4</sup>		29.17 <sup>.15</sup>	82.6 <sup>0.6</sup>	
25.6	24.13 <sup>.11</sup>	79.3 <sup>1.0</sup>		13.84 <sup>.15</sup>	42.2 <sup>2.3</sup>		3.85 <sup>.11</sup>	77.6 <sup>0.8</sup>		11.20 <sup>.16</sup>	9.5 <sup>2.6</sup>		29.32 <sup>.12</sup>	83.2 <sup>0.4</sup>	
Oct. 5.5	24.24 <sup>.08</sup>	80.3 <sup>0.7</sup>		13.99 <sup>.10</sup>	44.5 <sup>2.2</sup>		3.96 <sup>.09</sup>	78.4 <sup>0.5</sup>		11.36 <sup>.08</sup>	12.1 <sup>2.9</sup>		29.44 <sup>.09</sup>	83.6 <sup>0.1</sup>	
15.5	24.32 <sup>.05</sup>	81.0 <sup>0.6</sup>		14.09 <sup>.06</sup>	46.7 <sup>2.1</sup>		4.05 <sup>.05</sup>	78.9 <sup>0.4</sup>		11.44 <sup>.02</sup>	15.0 <sup>3.0</sup>		29.53 <sup>.05</sup>	83.7 <sup>0.0</sup>	
25.5	24.37 <sup>.02</sup>	81.6 <sup>0.4</sup>		14.15 <sup>.02</sup>	48.8 <sup>1.9</sup>		4.10 <sup>.02</sup>	79.3 <sup>0.2</sup>		11.46 <sup>.05</sup>	18.0 <sup>2.9</sup>		29.58 <sup>.03</sup>	83.7 <sup>0.2</sup>	
Nov. 4.4	24.39 <sup>.01</sup>	82.0 <sup>0.2</sup>		14.17 <sup>.02</sup>	50.7 <sup>1.7</sup>		4.12 <sup>.00</sup>	79.5 <sup>0.0</sup>		11.41 <sup>.12</sup>	20.8 <sup>2.9</sup>		29.61 <sup>.00</sup>	83.5 <sup>0.4</sup>	
14.4	24.38 <sup>.04</sup>	82.2 <sup>0.0</sup>		14.15 <sup>.05</sup>	52.4 <sup>1.4</sup>		4.12 <sup>.03</sup>	79.5 <sup>0.1</sup>		11.29 <sup>.17</sup>	23.8 <sup>2.6</sup>		29.61 <sup>.03</sup>	83.1 <sup>0.5</sup>	
24.4	24.34 <sup>.06</sup>	82.2 <sup>0.1</sup>		14.10 <sup>.09</sup>	53.8 <sup>1.1</sup>		4.09 <sup>.05</sup>	79.4 <sup>0.3</sup>		11.12 <sup>.22</sup>	26.4 <sup>2.3</sup>		29.58 <sup>.05</sup>	82.6 <sup>0.6</sup>	
Dec. 4.4	24.28 <sup>.08</sup>	82.1 <sup>0.3</sup>		14.01 <sup>.12</sup>	54.9 <sup>0.8</sup>		4.04 <sup>.08</sup>	79.1 <sup>0.4</sup>		10.90 <sup>.27</sup>	28.7 <sup>1.9</sup>		29.53 <sup>.08</sup>	82.0 <sup>0.6</sup>	
14.3	24.20 <sup>.10</sup>	81.8 <sup>0.4</sup>		13.89 <sup>.14</sup>	55.7 <sup>0.5</sup>		3.96 <sup>.10</sup>	78.7 <sup>0.5</sup>		10.63 <sup>.29</sup>	30.6 <sup>1.3</sup>		29.45 <sup>.09</sup>	81.4 <sup>0.7</sup>	
24.3	24.10 <sup>.12</sup>	81.4 <sup>0.5</sup>		13.75 <sup>.17</sup>	56.2 <sup>0.1</sup>		3.86 <sup>.12</sup>	78.2 <sup>0.6</sup>		10.34 <sup>.32</sup>	31.9 <sup>0.9</sup>		29.36 <sup>.11</sup>	80.7 <sup>0.7</sup>	
34.3	23.98	80.9		13.58	56.3		3.74	77.6		10.02	32.8		29.25	80.0	

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Piscium.		$\zeta$ Ceti.		$\beta$ Arietis.		$\delta$ Cassiopeiæ.		$\gamma$ Andromedæ.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m I 40	° ' " + 8 40	h m I 46	° ' " - 10 48	h m I 49	° ' " + 20 20	h m I 55	° ' " + 71 57	h m I 57	° ' " + 41 51
Jan. 0.3	19.92	26.8	43.68	41.8	20.80	21.5	16.72	38.5	61.39	76.7
10.3	19.80	26.1	43.55	42.6	20.68	21.0	16.17	39.4	61.22	76.8
20.3	19.66	25.4	43.41	43.3	20.53	20.4	15.57	39.8	61.02	76.6
30.3	19.52	24.8	43.27	43.8	20.38	19.6	14.95	39.6	60.81	76.0
Feb. 9.2	19.38	24.1	43.12	44.1	20.23	18.8	14.34	38.7	60.59	75.0
19.2	19.25	23.5	42.98	44.1	20.08	17.9	13.75	37.4	60.38	73.8
29.1	19.13	22.9	42.86	43.8	19.94	17.0	13.22	35.5	60.19	72.3
Mar. 10.1	19.03	22.5	42.75	43.3	19.83	16.0	12.77	33.3	60.03	70.7
20.1	18.96	22.2	42.68	42.6	19.75	15.2	12.42	30.7	59.91	68.9
30.1	18.93	22.1	42.63	41.6	19.70	14.4	12.19	28.0	59.83	67.1
Apr. 9.0	18.93	22.2	42.62	40.4	19.70	13.8	12.09	25.1	59.81	65.4
19.0	18.98	22.5	42.66	38.9	19.74	13.4	12.12	22.3	59.85	63.8
29.0	19.08	23.1	42.74	37.2	19.83	13.3	12.29	19.7	59.94	62.4
May 8.9	19.22	23.9	42.86	35.4	19.97	13.4	12.60	17.2	60.10	61.3
18.9	19.40	24.9	43.03	33.3	20.15	13.8	13.02	15.1	60.31	60.5
June 28.9	19.61	26.2	43.23	31.2	20.38	14.4	13.56	13.3	60.57	60.0
7.9	19.86	27.7	43.47	29.0	20.64	15.3	14.18	12.0	60.88	59.9
17.8	20.14	29.3	43.74	26.8	20.92	16.5	14.88	11.1	61.21	60.1
27.8	20.43	31.0	44.03	24.7	21.22	17.9	15.64	10.8	61.57	60.7
July 7.8	20.73	32.8	44.33	22.6	21.54	19.4	16.42	10.9	61.95	61.7
17.8	21.04	34.6	44.63	20.7	21.86	21.1	17.22	11.6	62.34	62.9
27.7	21.34	36.4	44.93	19.1	22.17	22.8	18.02	12.7	62.71	64.5
Aug. 6.7	21.63	38.2	45.22	17.7	22.47	24.6	18.79	14.2	63.08	66.2
16.7	21.90	39.8	45.49	16.6	22.76	26.4	19.52	16.2	63.42	68.2
26.7	22.14	41.2	45.74	15.8	23.02	28.2	20.20	18.6	63.74	70.3
Sept. 5.6	22.36	42.4	45.96	15.4	23.25	29.8	20.82	21.2	64.03	72.6
15.6	22.54	43.5	46.15	15.3	23.45	31.4	21.36	24.2	64.29	74.9
25.6	22.70	44.3	46.31	15.5	23.63	32.8	21.81	27.3	64.51	77.2
Oct. 5.5	22.82	44.9	46.44	16.0	23.77	34.0	22.18	30.6	64.69	79.4
15.5	22.91	45.2	46.53	16.8	23.87	35.0	22.44	34.0	64.83	81.7
Nov. 25.5	22.98	45.4	46.59	17.8	23.95	35.9	22.61	37.4	64.92	83.8
4.5	23.01	45.4	46.62	19.0	23.99	36.6	22.67	40.7	64.99	85.7
14.4	23.01	45.3	46.62	20.2	24.01	37.1	22.62	43.8	65.01	87.5
24.4	22.99	45.0	46.59	21.5	23.99	37.5	22.47	46.8	64.99	89.0
Dec. 4.4	22.94	44.5	46.54	22.8	23.95	37.6	22.22	49.4	64.93	90.4
14.3	22.87	44.0	46.46	24.0	23.88	37.6	21.86	51.6	64.83	91.4
24.3	22.77	43.5	46.36	25.1	23.78	37.5	21.42	53.4	64.70	92.0
34.3	22.66	42.8	46.25	26.1	23.67	37.1	20.90	54.7	64.54	92.4

# FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

331

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Arietis.			$\beta$ Trianguli.			$\zeta^1$ Ceti.			$\gamma$ Trianguli.			67 Ceti.		
	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion South.
	h	m	°	h	m	°	h	m	°	h	m	°	h	m	°
	2	1	+23	2	3	+34	2	7	+8	2	11	+33	2	12	-6
			0			31			23			24			51
			"			"			"			"			"
Jan. 0.3	46.40	.12	32.9	50.76	.15	65.1	55.30	.11	44.0	37.34	.14	16.4	12.21	.11	60.4
10.3	46.28	.15	32.5	50.61	.17	65.1	55.19	.13	43.3	37.20	.16	16.4	12.10	.14	61.3
20.3	46.13	.15	32.0	50.44	.18	64.8	55.06	.15	42.7	37.04	.18	16.1	11.96	.14	62.1
30.3	45.98	.17	31.4	50.26	.19	64.2	54.91	.14	42.0	36.86	.19	15.5	11.82	.15	62.7
Feb. 9.2	45.81	.15	30.6	50.07	.18	63.3	54.77	.15	41.4	36.67	.18	14.7	11.67	.15	63.1
19.2	45.66	.15	29.6	49.89	.17	62.2	54.62	.14	40.8	36.49	.18	13.7	11.52	.14	63.3
29.2	45.51	.13	28.7	49.72	.15	61.0	54.48	.12	40.3	36.31	.15	12.5	11.38	.12	63.2
Mar. 10.1	45.38	.09	27.7	49.57	.11	59.6	54.36	.09	39.9	36.16	.12	11.2	11.26	.10	63.0
20.1	45.29	.06	26.7	49.46	.07	58.1	54.27	.06	39.7	36.04	.07	9.9	11.16	.07	62.5
30.1	45.23	.02	25.8	49.39	.02	56.7	54.21	.02	39.6	35.97	.03	8.5	11.09	.03	61.8
Apr. 9.0	45.21	.03	25.1	49.37	.03	55.3	54.19	.02	39.7	35.94	.02	7.2	11.06	.01	60.8
19.0	45.24	.08	24.5	49.40	.08	54.1	54.21	.07	40.0	35.96	.07	6.1	11.07	.06	59.6
29.0	45.32	.13	24.2	49.48	.14	53.1	54.28	.11	40.6	36.03	.13	5.1	11.13	.10	58.2
May 9.0	45.45	.18	24.1	49.62	.19	52.4	54.39	.15	41.3	36.16	.18	4.4	11.23	.14	56.5
18.9	45.63	.22	24.3	49.81	.23	51.9	54.54	.20	42.3	36.34	.23	4.0	11.37	.19	54.7
28.9	45.85	.25	24.8	50.04	.28	51.7	54.74	.23	43.5	36.57	.26	3.8	11.56	.22	52.8
June 7.9	46.10	.28	25.5	50.32	.31	51.9	54.97	.26	44.9	36.83	.30	4.0	11.78	.25	50.8
17.9	46.38	.31	26.5	50.63	.33	52.4	55.23	.28	46.4	37.13	.33	4.5	12.03	.28	48.7
27.8	46.69	.32	27.7	50.96	.35	53.2	55.51	.30	48.1	37.46	.34	5.3	12.31	.29	46.6
July 7.8	47.01	.32	29.1	51.31	.35	54.3	55.81	.30	49.8	37.80	.35	6.4	12.60	.29	44.6
17.8	47.33	.32	30.7	51.66	.35	55.7	56.11	.30	51.6	38.15	.35	7.7	12.89	.30	42.7
27.7	47.65	.31	32.4	52.01	.34	57.2	56.41	.30	53.3	38.50	.34	9.2	13.19	.29	41.0
Aug. 6.7	47.96	.29	34.1	52.35	.32	59.0	56.71	.28	54.9	38.84	.32	10.9	13.48	.28	39.5
16.7	48.25	.27	35.9	52.67	.30	60.9	56.99	.26	56.5	39.16	.30	12.7	13.76	.26	38.2
26.7	48.52	.25	37.6	52.97	.27	62.8	57.25	.23	57.8	39.46	.27	14.6	14.02	.24	37.3
Sept. 5.6	48.77	.22	39.3	53.24	.24	64.8	57.48	.21	59.0	39.73	.24	16.5	14.26	.21	36.7
15.6	48.99	.18	40.9	53.48	.21	66.9	57.69	.18	60.0	39.97	.22	18.4	14.47	.18	36.4
25.6	49.17	.16	42.4	53.69	.17	68.8	57.87	.15	60.7	40.19	.18	20.3	14.65	.15	36.4
Oct. 5.6	49.33	.12	43.7	53.86	.14	70.8	58.02	.12	61.3	40.37	.14	22.1	14.80	.12	36.7
15.5	49.45	.09	44.9	54.00	.10	72.6	58.14	.09	61.6	40.51	.11	23.9	14.92	.08	37.3
25.5	49.54	.06	45.9	54.10	.07	74.3	58.23	.06	61.7	40.62	.08	25.5	15.00	.06	38.1
Nov. 4.5	49.60	.03	46.8	54.17	.03	75.8	58.29	.03	61.7	40.70	.04	26.9	15.06	.03	39.1
14.4	49.63	.00	47.4	54.20	.01	77.2	58.32	.01	61.5	40.74	.00	28.2	15.09	.00	40.2
24.4	49.63	.04	48.0	54.19	.04	78.3	58.33	.04	61.1	40.74	.03	29.3	15.09	.03	41.4
Dec. 4.4	49.59	.06	48.3	54.15	.07	79.3	58.29	.05	60.7	40.71	.07	30.2	15.06	.06	42.6
14.4	49.53	.09	48.4	54.08	.11	80.0	58.24	.08	60.2	40.64	.09	30.9	15.00	.08	43.7
24.3	49.44	.11	48.4	53.97	.13	80.4	58.16	.10	59.6	40.55	.13	31.3	14.92	.10	44.8
34.3	49.33		48.2	53.84		80.6	58.06		59.0	40.42		31.5	14.82		45.8

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\delta$ Hydri.		$\epsilon$ Cassiopeiz.		$\xi^2$ Ceti.		$\mu$ Hydri.		$\delta$ Ceti.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.
	h m 2 19	° -69 5	h m 2 21	° +66 58	h m 2 23	° + 8 1	h m 2 33	° -79 31	h m 2 34	° - 0 4
	s	"	s	"	s	"	s	"	s	"
Jan. 0.3	62.59	69.0	11.76	26.8	3.96	43.8	42.36	65.4	34.40	74.3
10.3	62.05	54.10	11.37	27.9	3.85	43.2	41.21	66.3	34.29	75.2
20.3	61.48	57.03	10.93	28.5	3.72	42.5	40.00	66.7	34.16	75.9
30.2	60.90	58.02	10.46	28.5	3.58	41.9	38.76	66.4	34.02	76.5
Feb. 9.2	60.32	58.09	9.98	27.9	3.43	41.3	37.53	65.6	33.87	77.0
	59.76	57.8	9.51	26.9	3.28	40.8	36.34	64.2	33.71	77.4
19.2	59.25	57.9	9.07	25.4	3.13	40.3	35.22	62.3	33.57	77.6
29.2	58.78	56.9	8.68	23.4	3.00	40.0	34.20	59.9	33.43	77.7
Mar. 10.1	58.38	56.8	8.37	21.1	2.90	39.7	33.30	57.1	33.31	77.5
20.1	58.06	57.7	8.14	18.7	2.82	39.7	32.55	54.0	33.23	77.2
30.1										
Apr. 9.1	57.82	54.3	8.01	16.0	2.79	39.8	31.96	50.6	33.18	76.6
19.0	57.68	50.7	7.99	13.4	2.79	40.1	31.56	47.1	33.17	75.8
29.0	57.65	47.1	8.08	10.9	2.85	40.6	31.34	43.4	33.21	74.8
May 9.0	57.72	43.4	8.27	8.5	2.94	41.4	31.32	39.7	33.29	73.6
18.9	57.89	39.7	8.57	6.4	3.08	42.4	31.50	36.1	33.42	72.2
28.9	58.16	36.2	8.96	4.6	3.27	43.6	31.87	32.6	33.59	70.6
June 7.9	58.52	32.9	9.44	3.2	3.49	44.9	32.42	29.4	33.80	68.9
17.9	58.97	30.0	9.98	2.2	3.74	46.4	33.15	26.4	34.04	67.1
27.8	59.50	27.4	10.58	1.7	4.02	48.0	34.03	23.8	34.30	65.3
July 7.8	60.08	25.2	11.21	1.6	4.31	49.8	35.03	21.7	34.58	63.4
17.8	60.70	23.5	11.86	2.0	4.61	51.5	36.14	20.1	34.87	61.6
27.8	61.35	22.4	12.52	2.9	4.91	53.1	37.31	19.0	35.17	59.9
Aug. 6.7	62.00	21.9	13.16	4.2	5.21	54.7	38.51	18.5	35.46	58.3
16.7	62.65	22.0	13.79	5.9	5.49	56.2	39.71	18.6	35.75	56.9
26.7	63.25	22.6	14.38	7.9	5.75	57.6	40.87	19.3	36.02	55.8
Sept. 5.6	63.81	23.9	14.92	10.3	6.00	58.7	41.95	20.6	36.26	55.0
15.6	64.31	25.8	15.41	12.9	6.22	59.6	42.91	22.4	36.49	54.4
25.6	64.72	28.1	15.84	15.7	6.41	60.3	43.72	24.8	36.69	54.1
Oct. 5.6	65.04	30.8	16.21	18.7	6.58	60.8	44.36	27.5	36.86	54.0
15.5	65.25	33.8	16.50	21.8	6.71	61.1	44.80	30.6	37.00	54.3
25.5	65.36	37.0	16.71	25.0	6.82	61.1	45.02	33.8	37.11	54.7
Nov. 4.5	65.36	40.2	16.84	28.1	6.89	61.0	45.02	37.1	37.19	55.3
14.5	65.25	43.4	16.89	31.1	6.94	60.8	44.79	40.3	37.25	56.1
24.4	65.04	46.5	16.85	33.9	6.95	60.4	44.36	43.4	37.27	56.9
Dec. 4.4	64.74	49.2	16.73	36.5	6.94	59.9	43.72	46.1	37.26	57.8
14.4	64.35	51.5	16.52	38.8	6.90	59.4	42.90	48.5	37.23	58.8
24.3	63.90	53.3	16.24	40.6	6.83	58.8	41.94	50.4	37.16	59.7
34.3	63.39	54.6	15.88	42.0	6.73	58.2	40.86	51.7	37.07	60.5

# FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

333

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	θ Persei.		γ Ceti.		σ Arietis.		47 Cephei (H.)		ε Arietis.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 2 37	° ' +48 49	h m 2 38	° ' + 2 49	h m 2 46	° ' +14 41	h m 2 53	° ' +79 2	h m 2 53	° ' +20 57
	s	"	s	"	s	"	s	"	s	"
Jan. 0.3	40.02	28.2	20.29	46.9	12.39	8.9	24.54	33.2	44.29	22.1
10.3	39.84	28.8	20.18	46.1	12.29	8.4	23.73	35.0	44.19	21.9
20.3	39.62	29.1	20.06	45.4	12.16	7.9	22.80	36.2	44.06	21.6
30.3	39.38	29.0	19.92	44.8	12.01	7.3	21.78	36.9	43.91	21.1
Feb. 9.2	39.12	28.5	19.76	44.2	11.86	6.7	20.72	37.0	43.74	20.6
19.2	38.86	27.6	19.61	43.8	11.69	6.2	19.65	36.4	43.57	20.0
29.2	38.61	26.3	19.46	43.5	11.53	5.6	18.62	35.3	43.40	19.3
Mar. 10.2	38.38	24.8	19.32	43.3	11.39	5.0	17.68	33.7	43.24	18.6
20.1	38.19	23.1	19.20	43.3	11.26	4.5	16.87	31.6	43.11	17.8
30.1	38.06	21.2	19.11	43.5	11.17	4.1	16.23	29.1	43.01	17.2
Apr. 9.1	37.98	19.3	19.06	43.9	11.11	3.9	15.77	26.4	42.94	16.6
19.0	37.96	17.4	19.05	44.5	11.09	3.8	15.52	23.6	42.92	16.2
29.0	38.01	15.6	19.09	45.3	11.12	3.9	15.48	20.7	42.94	15.9
May 9.0	38.12	14.0	19.17	46.4	11.20	4.2	15.67	17.8	43.02	15.8
19.0	38.30	12.6	19.29	47.6	11.33	4.8	16.07	15.1	43.14	16.0
28.9	38.55	11.5	19.46	49.0	11.50	5.5	16.67	12.7	43.31	16.3
June 7.9	38.85	10.8	19.66	50.6	11.71	6.5	17.44	10.6	43.52	16.9
17.9	39.19	10.4	19.90	52.3	11.95	7.6	18.38	8.9	43.77	17.7
27.9	39.57	10.3	20.16	54.0	12.22	8.9	19.44	7.6	44.04	18.7
July 7.8	39.97	10.7	20.45	55.8	12.51	10.3	20.59	6.8	44.34	19.9
17.8	40.39	11.4	20.74	57.6	12.81	11.8	21.82	6.4	44.65	21.2
27.8	40.81	12.4	21.04	59.2	13.12	13.3	23.09	6.6	44.96	22.6
Aug. 6.7	41.23	13.7	21.33	60.8	13.42	14.9	24.38	7.2	45.28	24.0
16.7	41.64	15.3	21.61	62.2	13.72	16.3	25.65	8.3	45.58	25.5
26.7	42.03	17.1	21.88	63.4	14.00	17.7	26.88	9.8	45.88	26.9
Sept. 5.7	42.39	19.1	22.13	64.3	14.26	19.0	28.05	11.8	46.15	28.3
15.6	42.72	21.2	22.36	65.0	14.50	20.1	29.13	14.1	46.40	29.6
25.6	43.01	23.5	22.56	65.4	14.72	21.0	30.11	16.8	46.63	30.7
Oct. 5.6	43.27	25.8	22.74	65.6	14.91	21.8	30.97	19.7	46.84	31.8
15.6	43.48	28.1	22.88	65.5	15.07	22.4	31.68	22.9	47.01	32.7
25.5	43.65	30.5	23.00	65.3	15.20	22.8	32.24	26.2	47.16	33.4
Nov. 4.5	43.78	32.8	23.09	64.8	15.30	23.1	32.63	29.6	47.27	34.1
14.5	43.86	34.9	23.14	64.2	15.37	23.2	32.84	33.0	47.35	34.6
24.4	43.89	36.9	23.17	63.5	15.42	23.2	32.86	36.3	47.40	34.9
Dec. 4.4	43.88	38.7	23.17	62.8	15.43	23.1	32.68	39.5	47.42	35.2
14.4	43.81	40.2	23.14	62.0	15.40	22.8	32.31	42.4	47.40	35.3
24.4	43.69	41.5	23.08	61.1	15.35	22.5	31.76	45.0	47.35	35.3
34.3	43.54	42.4	22.99	60.4	15.26	22.2	31.04	47.1	47.27	35.2

## FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	33 Piscium.			α Andromedæ.			β Cassiopeiæ.			22 Andromedæ.			γ Pegasi. (Algenib.)		
	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.
	h	m	°	h	m	°	h	m	°	h	m	°	h	m	°
	0	0	6 14	0	3	+28 33	0	4	+58 37	0	5	+45 32	0	8	+14 38
Jan. 0.2	25.11		43.7	25.61		46.3	3.85		29.8	20.19		30.6	17.54		63.4
10.2	24.99	.12	44.3	25.46	.15	45.3	3.53	.32	29.0	19.98	.21	29.7	17.42	.12	62.5
20.2	24.88	.11	44.9	25.32	.14	44.0	3.22	.31	27.7	19.77	.21	28.4	17.30	.12	61.5
30.2	24.79	.09	45.3	25.19	.13	42.6	2.93	.29	26.0	19.58	.19	26.7	17.19	.11	60.5
Feb. 9.1	24.70	.09	45.5	25.08	.11	41.0	2.68	.25	23.8	19.42	.16	24.7	17.09	.10	59.4
		.06	45.5		.09	41.0		.20	23.8		.14	24.7		.07	59.4
19.1	24.64	.03	45.6	24.99	.06	39.3	2.48	.15	21.3	19.28	.09	22.6	17.02	.05	58.3
29.1	24.61	.01	45.4	24.93	.02	37.6	2.33	.07	18.7	19.19	.04	20.2	16.97	.02	57.2
Mar. 10.0	24.60		45.1	24.91		36.0	2.26		15.9	19.15		17.9	16.95		56.4
20.0	24.63	.03	44.5	24.93	.02	34.5	2.26	.00	13.1	19.16	.01	15.6	16.97	.02	55.7
30.0	24.70	.07	43.7	25.00	.07	33.2	2.34	.08	10.5	19.22	.06	13.5	17.03	.06	55.2
		.10	43.7		.11	33.2		.16	10.5		.13	13.5		.10	55.2
Apr. 9.0	24.80		42.7	25.11		32.2	2.50		8.1	19.35		11.6	17.13		55.0
18.9	24.94	.14	41.4	25.26	.15	31.6	2.73	.23	6.0	19.53	.18	10.1	17.27	.14	55.1
28.9	25.12	.18	39.9	25.47	.21	31.3	3.04	.31	4.4	19.77	.24	9.0	17.45	.18	55.5
May 8.9	25.34	.22	38.2	25.71	.24	31.4	3.40	.36	3.1	20.06	.29	8.3	17.67	.22	56.2
18.9	25.59	.25	36.4	25.98	.27	31.9	3.82	.42	2.4	20.39	.33	8.1	17.92	.25	57.3
		.27	36.4		.31	31.9		.46	2.4		.35	8.1		.28	57.3
28.8	25.86	.29	34.4	26.29	.32	32.7	4.28	.49	2.3	20.74	.39	8.3	18.20	.30	58.6
June 7.8	26.15	.31	32.4	26.61	.33	34.0	4.77	.50	2.6	21.13	.39	9.1	18.50	.31	60.2
17.8	26.46	.30	30.4	26.94	.34	35.5	5.27	.49	3.5	21.52	.40	10.2	18.81	.31	62.0
27.7	26.76	.30	28.4	27.28	.34	37.4	5.76	.49	4.9	21.92	.40	11.8	19.12	.31	63.9
July 7.7	27.06	.28	26.6	27.60	.31	39.4	6.25	.45	6.7	22.30	.38	13.8	19.43	.31	66.0
			26.6			39.4			6.7			13.8			66.0
17.7	27.34	.28	24.8	27.91	.29	41.7	6.70	.42	8.9	22.66	.34	16.1	19.72	.27	68.0
27.7	27.62	.24	23.3	28.20	.26	44.1	7.12	.37	11.5	23.00	.30	18.6	19.99	.25	70.2
Aug. 6.6	27.86	.21	22.0	28.46	.22	46.5	7.49	.32	14.4	23.30	.25	21.4	20.24	.21	72.2
16.6	28.07	.17	20.9	28.68	.18	49.0	7.81	.26	17.4	23.55	.21	24.3	20.45	.18	74.2
26.6	28.24	.14	20.1	28.86	.14	51.4	8.07	.20	20.7	23.76	.17	27.2	20.63	.14	76.0
			20.1			51.4			20.7			27.2			76.0
Sept. 5.6	28.38	.09	19.6	29.00	.10	53.7	8.27	.13	24.0	23.93	.11	30.2	20.77	.10	77.6
15.5	28.47	.06	19.4	29.10	.06	55.9	8.40	.07	27.4	24.04	.07	33.1	20.87	.07	79.1
25.5	28.53	.02	19.4	29.16	.02	57.9	8.47	.01	30.7	24.11	.02	36.0	20.94	.02	80.3
Oct. 5.5	28.55	.01	19.6	29.18	.01	59.7	8.48	.05	33.8	24.13	.03	38.6	20.96	.02	81.3
15.5	28.54	.05	20.1	29.17	.05	61.3	8.43	.11	36.8	24.10	.06	41.1	20.96	.03	82.1
			20.1			61.3			36.8			41.1			82.1
25.4	28.49	.06	20.7	29.12	.07	62.6	8.32	.16	39.6	24.04	.11	43.3	20.93	.06	82.7
Nov. 4.4	28.43	.09	21.4	29.05	.09	63.6	8.16	.20	42.0	23.93	.13	45.2	20.87	.08	83.0
14.4	28.34	.10	22.2	28.96	.12	64.4	7.96	.24	44.1	23.80	.16	46.7	20.79	.10	83.1
24.3	28.24	.11	23.0	28.84	.13	64.9	7.72	.28	45.7	23.64	.19	47.9	20.69	.11	83.0
Dec. 4.3	28.13	.11	23.9	28.71	.14	65.0	7.44	.30	46.8	23.45	.20	48.6	20.58	.12	82.8
			23.9			65.0			46.8			48.6			82.8
14.3	28.02	.12	24.7	28.57	.15	64.8	7.14	.32	47.5	23.25	.21	48.9	20.46	.12	82.3
24.3	27.90	.12	25.4	28.42	.15	64.3	6.82	.33	47.6	23.04	.21	48.7	20.34	.13	81.6
34.2	27.78		26.2	28.27		63.5	6.49		47.1	22.83		48.1	20.21		80.8



# FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

325

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\sigma$ Andromedæ.			$\iota$ Ceti.			44 Piscium.			$\beta$ Hydr.			$\iota_2$ Ceti.		
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion South.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion South.		Right Ascension.	Declina- tion South.	
	h m o 13	° ' " +36 15		h m o 14	° ' " - 9 21		h m o 20	° ' " + 1 24		h m o 20	° ' " -77 47		h m o 25	° ' " - 4 28	
	s	"		s	"		s	"		s	"		s	"	
Jan. 0.2	18.99	21.6	32.05	26.7	28.86	27.6	39.60	62.5	8.34	79.3					
10.2	18.82	20.6	31.92	27.3	28.74	26.9	38.69	61.5	8.22	80.0					
20.2	18.65	19.4	31.81	27.8	28.63	26.2	37.84	60.0	8.10	80.6					
30.2	18.49	17.9	31.70	28.1	28.52	25.5	37.07	57.9	7.99	81.0					
Feb. 9.1	18.35	16.2	31.61	28.2	28.42	24.9	36.40	55.4	7.89	81.4					
19.1	18.24	14.3	31.54	28.1	28.34	24.5	35.85	52.4	7.81	81.5					
29.1	18.16	12.4	31.49	27.8	28.29	24.2	35.43	49.1	7.75	81.5					
Mar. 10.1	18.12	10.4	31.47	27.3	28.26	24.1	35.16	45.6	7.72	81.2					
20.0	18.12	8.5	31.48	26.6	28.27	24.2	35.03	41.8	7.72	80.8					
30.0	18.18	6.9	31.53	25.6	28.31	24.5	35.06	38.1	7.76	80.1					
Apr. 9.0	18.28	5.4	31.62	24.3	28.40	25.1	35.25	34.3	7.84	79.2					
18.9	18.44	4.3	31.75	22.9	28.52	26.0	35.60	30.6	7.96	78.0					
28.9	18.65	3.6	31.92	21.2	28.69	27.0	36.10	27.1	8.12	76.6					
May 8.9	18.90	3.3	32.13	19.4	28.89	28.4	36.74	23.8	8.32	75.0					
18.9	19.19	3.4	32.36	17.5	29.12	29.9	37.50	20.8	8.55	73.2					
28.8	19.50	3.9	32.63	15.4	29.39	31.6	38.38	18.3	8.81	71.3					
June 7.8	19.84	4.8	32.92	13.4	29.68	33.5	39.36	16.1	9.09	69.3					
17.8	20.20	6.1	33.22	11.3	29.98	35.4	40.40	14.5	9.39	67.3					
27.8	20.55	7.8	33.53	9.3	30.28	37.4	41.48	13.4	9.70	65.3					
July 7.7	20.90	9.8	33.84	7.5	30.58	39.4	42.58	12.8	10.00	63.4					
17.7	21.24	12.0	34.13	5.8	30.88	41.3	43.66	12.8	10.30	61.6					
27.7	21.54	14.5	34.41	4.3	31.15	43.1	44.70	13.4	10.57	59.9					
Aug. 6.6	21.82	17.0	34.66	3.1	31.40	44.7	45.66	14.6	10.83	58.5					
16.6	22.06	19.7	34.88	2.1	31.62	46.1	46.51	16.2	11.05	57.3					
26.6	22.27	22.3	35.06	1.5	31.80	47.3	47.23	18.4	11.24	56.4					
Sept. 5.6	22.43	24.9	35.21	1.1	31.96	48.2	47.79	20.9	11.40	55.8					
15.5	22.54	27.4	35.32	1.1	32.07	48.9	48.18	23.7	11.52	55.4					
25.5	22.62	29.8	35.39	1.3	32.14	49.4	48.39	26.8	11.60	55.3					
Oct. 5.5	22.65	32.1	35.42	1.7	32.19	49.6	48.40	29.9	11.64	55.5					
15.5	22.64	34.1	35.42	2.3	32.19	49.6	48.23	33.0	11.66	55.8					
25.4	22.60	35.8	35.40	3.1	32.18	49.4	47.88	35.9	11.64	56.4					
Nov. 4.4	22.53	37.3	35.34	4.0	32.13	49.0	47.36	38.6	11.60	57.0					
14.4	22.43	38.5	35.26	5.0	32.06	48.5	46.71	40.9	11.53	57.8					
24.3	22.31	39.3	35.17	5.9	31.98	47.9	45.94	42.7	11.44	58.6					
Dec. 4.3	22.16	39.8	35.06	6.9	31.88	47.3	45.08	44.0	11.35	59.5					
14.3	22.00	39.9	34.95	7.8	31.77	46.5	44.17	44.7	11.24	60.3					
24.3	21.84	39.6	34.83	8.6	31.65	45.8	43.24	44.8	11.12	61.1					
34.2	21.66	38.9	34.70	9.3	31.53	45.0	42.32	44.2	11.00	61.9					

# FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\pi$ Andromedæ.		$\alpha$ Cassiopeïæ.		$\beta$ Ceti.		$\gamma$ Cassiopeïæ.		$\delta$ Cassiopeïæ.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 0 31	° ' " +33 11	h m 0 35	° ' " +56 0	h m 0 38	° ' " -18 30	h m 0 39	° ' " +74 27	h m 0 39	° ' " +47 45
Jan. 0.3	45.53	.16 36.5	4.31	.30 54.4	46.14	.13 57.2	20.35	.73 66.3	23.15	.23 45.6
10.2	45.37	.17 35.7	4.01	.29 53.9	46.01	.13 57.8	19.62	.72 66.2	22.92	.23 45.0
20.2	45.20	.16 34.7	3.72	.28 53.0	45.88	.13 58.1	18.90	.72 65.6	22.69	.23 44.1
30.2	45.04	.14 33.3	3.44	.26 51.6	45.75	.13 58.2	18.21	.69 64.4	22.47	.22 42.7
Feb. 9.1	44.90	.12 31.8	3.18	.23 49.7	45.64	.10 57.9	17.57	.64 62.6	22.26	.21 41.0
19.1	44.78	.09 30.1	2.95	.17 47.6	45.54	.08 57.5	17.02	.44 60.4	22.09	.14 39.0
29.1	44.69	.06 28.4	2.78	.12 45.1	45.46	.04 56.7	16.58	.31 57.7	21.95	.09 36.8
Mar. 10.1	44.63	.01 26.6	2.66	.05 42.6	45.42	.02 55.7	16.27	.17 54.9	21.86	.04 34.5
20.0	44.62	.03 24.9	2.61	.03 40.0	45.40	.03 54.4	16.10	.17 51.8	21.82	.04 32.2
30.0	44.65	.08 23.4	2.64	.09 37.4	45.43	.06 52.9	16.08	.14 48.8	21.83	.09 30.0
Apr. 9.0	44.73	.13 22.1	2.73	.17 35.0	45.49	.11 51.1	16.22	.29 45.9	21.92	.14 28.0
19.0	44.86	.19 21.1	2.90	.25 32.9	45.60	.14 49.2	16.51	.43 43.1	22.06	.21 20.2
28.9	45.05	.22 20.5	3.15	.31 31.2	45.74	.19 47.1	16.94	.56 40.7	22.27	.26 24.8
May 8.9	45.27	.27 20.2	3.46	.36 29.8	45.93	.23 44.8	17.50	.67 38.7	22.53	.31 23.8
18.9	45.54	.30 20.3	3.82	.41 28.9	46.16	.26 42.5	18.17	.76 37.1	22.84	.35 23.2
28.8	45.84	.33 20.8	4.23	.45 28.5	46.42	.28 40.2	18.93	.83 36.0	23.19	.38 23.0
June 7.8	46.17	.34 21.7	4.68	.46 28.6	46.70	.30 37.9	19.76	.87 35.5	23.57	.41 23.4
17.8	46.51	.35 23.0	5.14	.48 29.2	47.00	.32 35.7	20.63	.89 35.5	23.98	.40 24.2
27.8	46.86	.35 24.5	5.62	.47 30.3	47.32	.31 33.7	21.52	.88 36.1	24.38	.41 25.4
July 7.7	47.20	.33 26.4	6.09	.45 31.8	47.63	.31 31.8	22.40	.85 37.2	24.79	.40 27.0
17.7	47.53	.32 28.5	6.54	.43 33.7	47.94	.29 30.2	23.25	.80 38.8	25.19	.37 29.0
27.7	47.85	.28 30.8	6.97	.39 36.0	48.23	.28 28.9	24.05	.73 40.9	25.56	.34 31.2
Aug. 6.7	48.13	.25 33.2	7.36	.34 38.6	48.51	.24 28.0	24.78	.66 43.3	25.90	.31 33.7
16.6	48.38	.22 35.6	7.70	.30 41.4	48.75	.21 27.3	25.44	.55 46.2	26.21	.26 36.4
26.6	48.60	.18 38.1	8.00	.24 44.5	48.96	.18 27.1	25.99	.46 49.3	26.47	.21 39.3
Sept. 5.6	48.78	.14 40.5	8.24	.18 47.6	49.14	.13 27.2	26.45	.35 52.6	26.68	.17 42.2
15.5	48.92	.09 42.9	8.42	.13 50.8	49.27	.10 27.6	26.80	.23 56.2	26.85	.12 45.1
25.5	49.01	.06 45.1	8.55	.07 53.9	49.37	.06 28.3	27.03	.11 59.8	26.97	.08 47.9
Oct. 5.5	49.07	.02 47.2	8.62	.01 57.0	49.43	.02 29.3	27.14	.01 63.4	27.05	.02 50.7
15.5	49.09	.02 49.1	8.63	.04 60.0	49.45	.01 30.4	27.13	.12 66.9	27.07	.02 53.3
25.4	49.07	.05 50.7	8.59	.09 62.8	49.44	.04 31.8	27.01	.24 70.3	27.05	.06 55.7
Nov. 4.4	49.02	.07 52.1	8.50	.14 65.3	49.40	.07 33.2	26.77	.35 73.6	26.99	.09 57.8
14.4	48.95	.10 53.2	8.36	.18 67.5	49.33	.09 34.6	26.42	.45 76.4	26.90	.14 59.7
24.4	48.85	.13 54.0	8.18	.22 69.2	49.24	.10 35.9	25.97	.55 78.9	26.76	.16 61.2
Dec. 4.3	48.72	.14 54.4	7.96	.25 70.6	49.14	.12 37.2	25.42	.62 81.0	26.60	.19 62.3
14.3	48.58	.15 54.6	7.71	.27 71.5	49.02	.12 38.3	24.80	.68 82.5	26.41	.21 63.0
24.3	48.43	.16 54.4	7.44	.30 71.9	48.90	.13 39.2	24.12	.71 83.5	26.20	.23 63.2
34.2	48.27	.16 53.8	7.14	.30 71.8	48.77	.13 39.9	23.41	.71 83.8	25.97	.23 63.0

# FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

327

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	♌ Piscium.		γ Cassiopeiz.		μ Andromedæ.		43 Cephei (H.).		ε Piscium.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 0 43	° ' + 7 3	h m 0 50	° ' + 60 11	h m 0 51	° ' + 37 58	h m 0 55	° ' + 85 44	h m 0 57	° ' + 7 22
	s	"	s	"	s	"	s	"	s	"
Jan. 0-3	42.24	45.4	55.88	64.4	25.99	53.1	41.58	50.7	57.87	23.4
10-2	42.11	44.7	55.54	64.2	25.81	52.5	38.74	51.2	57.74	22.6
20-2	41.99	43.9	55.20	63.5	25.63	51.6	35.88	51.0	57.62	21.9
30-2	41.86	43.1	54.86	62.3	25.45	50.4	33.10	50.2	57.49	21.1
Feb. 9-2	41.75	42.4	54.54	60.6	25.28	48.9	30.52	48.7	57.37	20.4
	41.66	41.7	54.26	58.5	25.13	47.3	28.23	46.7	57.26	19.7
19-1	41.58	41.1	54.03	56.2	25.01	45.4	26.33	44.3	57.17	19.2
29-1	41.53	40.7	53.87	53.6	24.92	43.6	24.88	41.5	57.11	18.8
Mar. 10-1	41.51	40.5	53.78	50.9	24.88	41.7	23.95	38.4	57.08	18.5
20-0	41.54	40.5	53.77	48.2	24.89	39.9	23.56	35.3	57.08	18.5
30-0	41.60	40.7	53.84	45.7	24.95	38.4	23.74	32.2	57.13	18.7
Apr. 9-0	41.70	41.2	54.00	43.4	25.07	37.1	24.45	29.1	57.22	19.2
19-0	41.85	41.9	54.24	41.4	25.24	36.1	25.68	26.4	57.36	19.9
28-9	42.04	43.0	54.56	39.7	25.46	35.5	27.38	23.9	57.53	20.8
May 8-9	42.26	44.2	54.94	38.5	25.72	35.2	29.48	21.9	57.74	22.0
18-9	42.51	45.7	55.38	37.8	26.02	35.4	31.91	20.3	57.99	23.5
28-9	42.79	47.4	55.86	37.6	26.36	36.0	34.60	19.3	58.26	25.1
June 7-8	43.09	49.2	56.36	37.9	26.71	36.9	37.45	18.8	58.55	26.9
17-8	43.39	51.1	56.88	38.7	27.07	38.3	40.40	18.9	58.86	28.8
27-8	43.70	53.0	57.41	39.9	27.44	39.9	43.36	19.5	59.16	30.7
July 7-7	44.00	55.0	57.92	41.6	27.79	41.8	46.26	20.7	59.46	32.6
17-7	44.28	56.9	58.40	43.7	28.13	44.0	49.04	22.3	59.75	34.5
27-7	44.55	58.6	58.85	46.1	28.44	46.3	51.62	24.5	60.02	36.2
Aug. 6-7	44.78	60.3	59.25	48.8	28.72	48.8	53.96	27.0	60.27	37.9
16-6	44.99	61.7	59.60	51.8	28.97	51.3	56.01	30.0	60.48	39.3
26-6	45.16	62.9	59.89	54.9	29.18	53.8	57.73	33.2	60.67	40.6
Sept. 5-6	45.30	63.9	60.13	58.1	29.34	56.3	59.07	36.7	60.82	41.6
15-5	45.40	64.7	60.30	61.4	29.47	58.8	60.02	40.3	60.93	42.4
25-5	45.46	65.3	60.41	64.6	29.55	61.0	60.55	44.0	61.01	42.9
Oct. 5-5	45.50	65.6	60.45	67.7	29.60	63.2	60.64	47.8	61.06	43.3
15-5	45.50	65.7	60.43	70.7	29.61	65.1	60.29	51.5	61.08	43.4
25-5	45.47	65.7	60.36	73.4	29.58	66.8	59.48	55.0	61.06	43.4
Nov. 4-4	45.43	65.4	60.22	75.9	29.52	68.2	58.24	58.4	61.03	43.1
14-4	45.36	65.1	60.03	78.0	29.43	69.3	56.58	61.3	60.97	42.8
24-4	45.27	64.6	59.80	79.7	29.31	70.1	54.55	63.9	60.89	42.3
Dec. 4-3	45.17	64.0	59.52	80.9	29.17	70.5	52.18	65.9	60.79	41.7
14-3	45.06	63.3	59.21	81.6	29.01	70.6	49.56	67.4	60.68	41.1
24-3	44.93	62.6	58.88	81.7	28.83	70.3	46.75	68.2	60.56	40.4

# FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\beta$ Andromedæ.			$\kappa$ Tucanæ.			$f$ Piscium.			$\theta$ Ceti.			38 Cassiopeizæ.		
	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.
	h m I 4	° ' " +35 6		h m I 12	° ' " -69 22		h m I 12	° ' " +3 6		h m I 19	° ' " -8 40		h m I 24	° ' " +69 46	
Jan. 0.3	21.94	50.3	29.81	92.1	51.11	29.6	13.70	50.2	7.09	29.8					
10.2	21.77	49.8 <sup>0.5</sup>	29.26 <sup>0.55</sup>	92.0 <sup>0.1</sup>	50.98 <sup>0.13</sup>	28.8 <sup>0.8</sup>	13.58 <sup>0.12</sup>	51.0 <sup>0.8</sup>	6.58 <sup>0.51</sup>	30.3 <sup>0.5</sup>					
20.2	21.60	49.0 <sup>0.8</sup>	28.72 <sup>0.54</sup>	91.4 <sup>0.6</sup>	50.85 <sup>0.13</sup>	28.1 <sup>0.7</sup>	13.44 <sup>0.14</sup>	51.7 <sup>0.7</sup>	6.04 <sup>0.54</sup>	30.2 <sup>0.1</sup>					
30.2	21.42	47.9 <sup>1.1</sup>	28.19 <sup>0.53</sup>	90.2 <sup>1.2</sup>	50.72 <sup>0.13</sup>	27.5 <sup>0.6</sup>	13.31 <sup>0.13</sup>	52.1 <sup>0.4</sup>	5.50 <sup>0.54</sup>	29.5 <sup>0.7</sup>					
Feb. 9.2	21.25	46.6 <sup>1.3</sup>	27.70 <sup>0.49</sup>	88.5 <sup>1.7</sup>	50.60 <sup>0.12</sup>	26.9 <sup>0.5</sup>	13.18 <sup>0.12</sup>	52.4 <sup>0.3</sup>	4.97 <sup>0.53</sup>	28.2 <sup>1.3</sup>					
		1.6	0.44	2.3				0.0	0.48	1.7					
19.1	21.10	45.0 <sup>1.6</sup>	27.26 <sup>0.38</sup>	86.2 <sup>2.6</sup>	50.48 <sup>0.10</sup>	26.4 <sup>0.3</sup>	13.06 <sup>0.11</sup>	52.4 <sup>0.2</sup>	4.49 <sup>0.41</sup>	26.5 <sup>2.2</sup>					
29.1	20.98	43.4 <sup>1.7</sup>	26.88 <sup>0.30</sup>	83.6 <sup>3.1</sup>	50.38 <sup>0.07</sup>	26.1 <sup>0.2</sup>	12.95 <sup>0.11</sup>	52.2 <sup>0.4</sup>	4.08 <sup>0.34</sup>	24.3 <sup>2.5</sup>					
Mar. 10.1	20.88	41.7 <sup>1.7</sup>	26.58 <sup>0.22</sup>	80.5 <sup>3.3</sup>	50.31 <sup>0.05</sup>	25.9 <sup>0.0</sup>	12.87 <sup>0.05</sup>	51.8 <sup>0.7</sup>	3.74 <sup>0.23</sup>	21.8 <sup>2.7</sup>					
20.0	20.83	40.0 <sup>1.6</sup>	26.36 <sup>0.13</sup>	77.2 <sup>3.5</sup>	50.26 <sup>0.00</sup>	25.9 <sup>0.2</sup>	12.82 <sup>0.02</sup>	51.1 <sup>0.9</sup>	3.51 <sup>0.13</sup>	19.1 <sup>2.9</sup>					
30.0	20.83	38.4 <sup>1.4</sup>	26.23 <sup>0.04</sup>	73.7 <sup>3.7</sup>	50.26 <sup>0.03</sup>	26.1 <sup>0.5</sup>	12.80 <sup>0.02</sup>	50.2 <sup>1.1</sup>	3.38 <sup>0.00</sup>	16.2 <sup>2.8</sup>					
Apr. 9.0	20.87	37.0 <sup>1.2</sup>	26.19 <sup>0.07</sup>	70.0 <sup>3.7</sup>	50.29 <sup>0.07</sup>	26.6 <sup>0.7</sup>	12.82 <sup>0.06</sup>	49.1 <sup>1.4</sup>	3.38 <sup>0.12</sup>	13.4 <sup>2.7</sup>					
19.0	20.97	35.8 <sup>0.9</sup>	26.26 <sup>0.17</sup>	66.3 <sup>3.7</sup>	50.36 <sup>0.12</sup>	27.3 <sup>0.9</sup>	12.88 <sup>0.11</sup>	47.7 <sup>1.6</sup>	3.50 <sup>0.24</sup>	10.7 <sup>2.5</sup>					
28.9	21.12	34.9 <sup>0.5</sup>	26.43 <sup>0.26</sup>	62.6 <sup>3.5</sup>	50.48 <sup>0.16</sup>	28.2 <sup>1.2</sup>	12.99 <sup>0.15</sup>	46.1 <sup>1.8</sup>	3.74 <sup>0.36</sup>	8.2 <sup>2.3</sup>					
May 8.9	21.32	34.4 <sup>0.2</sup>	26.69 <sup>0.36</sup>	59.1 <sup>3.4</sup>	50.64 <sup>0.20</sup>	29.4 <sup>1.4</sup>	13.14 <sup>0.19</sup>	44.3 <sup>1.9</sup>	4.10 <sup>0.45</sup>	5.9 <sup>1.8</sup>					
18.9	21.57	34.2 <sup>0.2</sup>	27.05 <sup>0.44</sup>	55.7 <sup>3.1</sup>	50.84 <sup>0.23</sup>	30.8 <sup>1.6</sup>	13.33 <sup>0.23</sup>	42.4 <sup>2.1</sup>	4.55 <sup>0.55</sup>	4.1 <sup>1.4</sup>					
28.9	21.86	34.4 <sup>0.5</sup>	27.49 <sup>0.53</sup>	52.6 <sup>2.8</sup>	51.07 <sup>0.26</sup>	32.4 <sup>1.7</sup>	13.56 <sup>0.26</sup>	40.3 <sup>2.1</sup>	5.10 <sup>0.61</sup>	2.7 <sup>0.9</sup>					
June 7.8	22.17	34.9 <sup>1.0</sup>	28.02 <sup>0.58</sup>	49.8 <sup>2.4</sup>	51.33 <sup>0.29</sup>	34.1 <sup>1.8</sup>	13.82 <sup>0.28</sup>	38.2 <sup>2.1</sup>	5.71 <sup>0.67</sup>	1.8 <sup>0.4</sup>					
17.8	22.51	35.9 <sup>1.3</sup>	28.60 <sup>0.63</sup>	47.4 <sup>1.9</sup>	51.62 <sup>0.29</sup>	35.9 <sup>1.9</sup>	14.10 <sup>0.29</sup>	36.1 <sup>2.1</sup>	6.38 <sup>0.70</sup>	1.4 <sup>0.1</sup>					
27.8	22.86	37.2 <sup>1.5</sup>	29.23 <sup>0.67</sup>	45.5 <sup>1.4</sup>	51.91 <sup>0.31</sup>	37.8 <sup>2.0</sup>	14.39 <sup>0.30</sup>	34.0 <sup>2.0</sup>	7.08 <sup>0.72</sup>	1.5 <sup>0.6</sup>					
July 7.8	23.22	38.7 <sup>1.9</sup>	29.90 <sup>0.68</sup>	44.1 <sup>0.9</sup>	52.22 <sup>0.30</sup>	39.8 <sup>1.9</sup>	14.69 <sup>0.31</sup>	32.0 <sup>1.8</sup>	7.80 <sup>0.72</sup>	2.1 <sup>1.1</sup>					
17.7	23.56	40.6 <sup>2.0</sup>	30.58 <sup>0.67</sup>	43.2 <sup>0.2</sup>	52.52 <sup>0.29</sup>	41.7 <sup>1.7</sup>	15.00 <sup>0.29</sup>	30.2 <sup>1.6</sup>	8.52 <sup>0.70</sup>	3.2 <sup>1.6</sup>					
27.7	23.90	42.6 <sup>2.2</sup>	31.25 <sup>0.64</sup>	43.0 <sup>0.3</sup>	52.81 <sup>0.28</sup>	43.4 <sup>1.7</sup>	15.29 <sup>0.28</sup>	28.6 <sup>1.4</sup>	9.22 <sup>0.66</sup>	4.8 <sup>2.0</sup>					
Aug. 6.7	24.21	44.8 <sup>2.3</sup>	31.89 <sup>0.60</sup>	43.3 <sup>0.9</sup>	53.09 <sup>0.25</sup>	45.1 <sup>1.5</sup>	15.57 <sup>0.26</sup>	27.2 <sup>1.1</sup>	9.88 <sup>0.61</sup>	6.8 <sup>2.3</sup>					
16.6	24.50	47.1 <sup>2.4</sup>	32.49 <sup>0.54</sup>	44.2 <sup>1.4</sup>	53.34 <sup>0.22</sup>	46.6 <sup>1.2</sup>	15.83 <sup>0.23</sup>	26.1 <sup>0.8</sup>	10.49 <sup>0.55</sup>	9.1 <sup>2.7</sup>					
26.6	24.75	49.5 <sup>2.4</sup>	33.03 <sup>0.45</sup>	45.6 <sup>2.0</sup>	53.56 <sup>0.20</sup>	47.8 <sup>1.1</sup>	16.06 <sup>0.20</sup>	25.3 <sup>0.5</sup>	11.04 <sup>0.49</sup>	11.8 <sup>3.0</sup>					
Sept. 5.6	24.97	51.9 <sup>2.3</sup>	33.48 <sup>0.37</sup>	47.6 <sup>2.4</sup>	53.76 <sup>0.16</sup>	48.9 <sup>0.7</sup>	16.26 <sup>0.17</sup>	24.8 <sup>0.2</sup>	11.53 <sup>0.40</sup>	14.8 <sup>3.2</sup>					
15.6	25.14	54.2 <sup>2.2</sup>	33.85 <sup>0.26</sup>	50.0 <sup>2.7</sup>	53.92 <sup>0.13</sup>	49.6 <sup>0.6</sup>	16.43 <sup>0.13</sup>	24.6 <sup>0.2</sup>	11.93 <sup>0.33</sup>	18.0 <sup>3.3</sup>					
25.5	25.28	56.4 <sup>2.2</sup>	34.11 <sup>0.16</sup>	52.7 <sup>3.0</sup>	54.05 <sup>0.09</sup>	50.2 <sup>0.3</sup>	16.56 <sup>0.10</sup>	24.8 <sup>0.4</sup>	12.26 <sup>0.24</sup>	21.3 <sup>3.4</sup>					
Oct. 5.5	25.38	58.6 <sup>1.9</sup>	34.27 <sup>0.04</sup>	55.7 <sup>3.1</sup>	54.14 <sup>0.06</sup>	50.5 <sup>0.0</sup>	16.66 <sup>0.07</sup>	25.2 <sup>0.7</sup>	12.50 <sup>0.15</sup>	24.7 <sup>3.4</sup>					
15.5	25.44	60.5 <sup>1.8</sup>	34.31 <sup>0.06</sup>	58.8 <sup>3.1</sup>	54.20 <sup>0.04</sup>	50.5 <sup>0.1</sup>	16.73 <sup>0.03</sup>	25.9 <sup>0.8</sup>	12.65 <sup>0.05</sup>	28.1 <sup>3.3</sup>					
25.5	25.47	62.3 <sup>1.6</sup>	34.25 <sup>0.17</sup>	61.9 <sup>3.0</sup>	54.24 <sup>0.00</sup>	50.4 <sup>0.3</sup>	16.76 <sup>0.00</sup>	26.7 <sup>1.0</sup>	12.70 <sup>0.03</sup>	31.4 <sup>3.2</sup>					
Nov. 4.4	25.46	63.9 <sup>1.3</sup>	34.08 <sup>0.27</sup>	64.9 <sup>2.8</sup>	54.24 <sup>0.03</sup>	50.1 <sup>0.5</sup>	16.76 <sup>0.02</sup>	27.7 <sup>1.1</sup>	12.67 <sup>0.13</sup>	34.6 <sup>3.0</sup>					
14.4	25.42	65.2 <sup>1.0</sup>	33.81 <sup>0.35</sup>	67.7 <sup>2.5</sup>	54.21 <sup>0.04</sup>	49.6 <sup>0.5</sup>	16.74 <sup>0.05</sup>	28.8 <sup>1.1</sup>	12.54 <sup>0.21</sup>	37.6 <sup>2.7</sup>					
24.4	25.35	66.2 <sup>0.7</sup>	33.46 <sup>0.43</sup>	70.2 <sup>2.0</sup>	54.17 <sup>0.07</sup>	49.1 <sup>0.7</sup>	16.69 <sup>0.07</sup>	29.9 <sup>1.1</sup>	12.33 <sup>0.30</sup>	40.3 <sup>2.3</sup>					
Dec. 4.3	25.25	66.9 <sup>0.4</sup>	33.03 <sup>0.48</sup>	72.2 <sup>1.5</sup>	54.10 <sup>0.09</sup>	48.4 <sup>0.7</sup>	16.62 <sup>0.09</sup>	31.0 <sup>1.1</sup>	12.03 <sup>0.38</sup>	42.6 <sup>1.9</sup>					
14.3	25.12	67.3 <sup>0.1</sup>	32.55 <sup>0.51</sup>	73.7 <sup>1.0</sup>	54.01 <sup>0.10</sup>	47.7 <sup>0.7</sup>	16.53 <sup>0.10</sup>	32.1 <sup>1.0</sup>	11.65 <sup>0.44</sup>	44.5 <sup>1.4</sup>					
24.3	24.98	67.4 <sup>0.2</sup>	32.04 <sup>0.54</sup>	74.7 <sup>0.3</sup>	53.91 <sup>0.12</sup>	47.0 <sup>0.8</sup>	16.43 <sup>0.12</sup>	33.1 <sup>0.9</sup>	11.21 <sup>0.49</sup>	45.9 <sup>0.8</sup>					
34.3	24.82	67.2	31.50	75.0	53.79	46.2	16.31	34.0	10.72	46.7					

# FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

329

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\eta$ Piscium.		$\nu$ Andromedæ.		$\pi$ Piscium.		$\alpha$ Eridani. (Achernar.)		$\nu$ Piscium.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.
	h m I 26	° ' " +14 50	h m I 31	° ' " +40 55	h m I 32	° ' " +11 38	h m I 34	° ' " -57 43	h m I 36	° ' " + 4 59
Jan. 0.3	21.21	64.5	10.57	40.2	0.99	61.4	8.12	48.9	26.54	63.9
10.3	21.08	63.8	10.39	40.0	0.87	60.7	7.79	49.4	26.42	63.2
20.2	20.94	63.1	10.19	39.5	0.73	60.0	7.45	49.4	26.29	62.5
30.2	20.80	62.3	9.98	38.6	0.59	59.3	7.11	48.8	26.15	61.8
Feb. 9.2	20.66	61.5	9.78	37.4	0.45	58.5	6.79	47.6	26.01	61.2
19.2	20.53	60.6	9.59	36.0	0.32	57.8	6.50	45.9	25.88	60.7
29.1	20.42	59.8	9.42	34.3	0.21	57.1	6.23	43.8	25.77	60.3
Mar. 10.1	20.33	59.1	9.29	32.5	0.11	56.5	6.01	41.3	25.67	60.0
20.1	20.27	58.5	9.20	30.7	0.05	56.1	5.84	38.5	25.61	59.9
30.1	20.24	58.0	9.16	28.8	0.02	55.8	5.73	35.3	25.58	60.0
Apr. 9.0	20.26	57.7	9.17	27.1	0.04	55.7	5.68	32.0	25.58	60.3
19.0	20.33	57.7	9.24	25.6	0.10	55.8	5.70	28.5	25.64	60.9
29.0	20.44	57.9	9.37	24.3	0.20	56.2	5.79	24.9	25.73	61.7
May 8.9	20.60	58.4	9.55	23.3	0.34	56.9	5.95	21.4	25.87	62.7
18.9	20.79	59.2	9.79	22.7	0.53	57.8	6.18	18.0	26.05	64.0
28.9	21.02	60.2	10.07	22.4	0.76	59.0	6.47	14.7	26.27	65.4
June 7.9	21.29	61.4	10.39	22.5	1.02	60.3	6.82	11.7	26.52	67.0
17.9	21.58	62.9	10.74	23.0	1.30	61.9	7.22	9.0	26.79	68.8
27.9	21.88	64.5	11.10	23.9	1.60	63.6	7.65	6.7	27.09	70.6
July 7.8	22.19	66.3	11.48	25.1	1.90	65.4	8.11	4.9	27.39	72.5
17.7	22.50	68.1	11.86	26.6	2.21	67.2	8.58	3.5	27.69	74.3
27.7	22.81	70.0	12.22	28.4	2.51	69.0	9.06	2.7	27.99	76.1
Aug. 6.7	23.09	71.8	12.57	30.5	2.80	70.8	9.52	2.5	28.27	77.8
16.7	23.36	73.6	12.89	32.7	3.06	72.5	9.95	2.9	28.54	79.3
26.6	23.60	75.3	13.18	35.0	3.30	74.0	10.34	3.8	28.78	80.6
Sept. 5.6	23.81	76.8	13.44	37.4	3.52	75.4	10.69	5.2	28.99	81.7
15.6	23.99	78.1	13.66	39.8	3.70	76.6	10.98	7.1	29.17	82.6
25.6	24.13	79.3	13.84	42.2	3.85	77.6	11.20	9.5	29.32	83.2
Oct. 5.5	24.24	80.3	13.99	44.5	3.96	78.4	11.36	12.1	29.44	83.6
15.5	24.32	81.0	14.09	46.7	4.05	78.9	11.44	15.0	29.53	83.7
25.5	24.37	81.6	14.15	48.8	4.10	79.3	11.46	18.0	29.58	83.7
Nov. 4.4	24.39	82.0	14.17	50.7	4.12	79.5	11.41	20.9	29.61	83.5
14.4	24.38	82.2	14.15	52.4	4.12	79.5	11.29	23.8	29.61	83.1
24.4	24.34	82.2	14.10	53.8	4.09	79.4	11.12	26.4	29.58	82.6
Dec. 4.4	24.28	82.1	14.01	54.9	4.04	79.1	10.90	28.7	29.53	82.0
14.3	24.20	81.8	13.89	55.7	3.96	78.7	10.63	30.6	29.45	81.4
24.3	24.10	81.4	13.75	56.2	3.86	78.2	10.34	31.9	29.36	80.7
34.3	23.98	80.9	13.58	56.3	3.74	77.6	10.02	32.8	29.25	80.0

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	♈ Piscium.		♉ Ceti.		♊ Arietis.		♋ Cassiopeiæ.		♌ Andromedæ.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m I 40	° ' s + 8 40	h m I 46	° ' s - 10 48	h m I 49	° ' s + 20 20	h m I 55	° ' s + 71 57	h m I 57	° ' s + 41 51
Jan. 0.3	19.92	26.8	43.68	41.8	20.80	21.5	16.72	38.5	61.39	76.7
10.3	19.80	26.1	43.55	42.6	20.68	21.0	16.17	39.4	61.22	76.8
20.3	19.66	25.4	43.41	43.3	20.53	20.4	15.57	39.8	61.02	76.6
30.3	19.52	24.8	43.27	43.8	20.38	19.6	14.95	39.6	60.81	76.0
Feb. 9.2	19.38	24.1	43.12	44.1	20.23	18.8	14.34	38.7	60.59	75.0
19.2	19.25	23.5	42.98	44.1	20.08	17.9	13.75	37.4	60.38	73.8
29.1	19.13	22.9	42.86	43.8	19.94	17.0	13.22	35.5	60.19	72.3
Mar. 10.1	19.03	22.5	42.75	43.3	19.83	16.0	12.77	33.3	60.03	70.7
20.1	18.96	22.2	42.68	42.6	19.75	15.2	12.42	30.7	59.91	68.9
30.1	18.93	22.1	42.63	41.6	19.70	14.4	12.19	28.0	59.83	67.1
Apr. 9.0	18.93	22.2	42.62	40.4	19.70	13.8	12.09	25.1	59.81	65.4
19.0	18.98	22.5	42.66	38.9	19.74	13.4	12.12	22.3	59.85	63.8
29.0	19.08	23.1	42.74	37.2	19.83	13.3	12.29	19.7	59.94	62.4
May 8.9	19.22	23.9	42.86	35.4	19.97	13.4	12.60	17.2	60.10	61.3
18.9	19.40	24.9	43.03	33.3	20.15	13.8	13.02	15.1	60.31	60.5
June 28.9	19.61	26.2	43.23	31.2	20.38	14.4	13.56	13.3	60.57	60.0
7.9	19.86	27.7	43.47	29.0	20.64	15.3	14.18	12.0	60.88	59.9
17.8	20.14	29.3	43.74	26.8	20.92	16.5	14.88	11.1	61.21	60.1
27.8	20.43	31.0	44.03	24.7	21.22	17.9	15.64	10.8	61.57	60.7
July 7.8	20.73	32.8	44.33	22.6	21.54	19.4	16.42	10.9	61.95	61.7
17.8	21.04	34.6	44.63	20.7	21.86	21.1	17.22	11.6	62.34	62.9
27.7	21.34	36.4	44.93	19.1	22.17	22.8	18.02	12.7	62.71	64.5
Aug. 6.7	21.63	38.2	45.22	17.7	22.47	24.6	18.79	14.2	63.08	66.2
16.7	21.90	39.8	45.49	16.6	22.76	26.4	19.52	16.2	63.42	68.2
26.7	22.14	41.2	45.74	15.8	23.02	28.2	20.20	18.6	63.74	70.3
Sept. 5.6	22.36	42.4	45.96	15.4	23.25	29.8	20.82	21.2	64.03	72.6
15.6	22.54	43.5	46.15	15.3	23.45	31.4	21.36	24.2	64.29	74.9
25.6	22.70	44.3	46.31	15.5	23.63	32.8	21.81	27.3	64.51	77.2
Oct. 5.5	22.82	44.9	46.44	16.0	23.77	34.0	22.18	30.6	64.69	79.4
15.5	22.91	45.2	46.53	16.8	23.87	35.0	22.44	34.0	64.83	81.7
Nov. 25.5	22.98	45.4	46.59	17.8	23.95	35.9	22.61	37.4	64.92	83.8
4.5	23.01	45.4	46.62	19.0	23.99	36.6	22.67	40.7	64.99	85.7
14.4	23.01	45.3	46.62	20.2	24.01	37.1	22.62	43.8	65.01	87.5
24.4	22.99	45.0	46.59	21.5	23.99	37.5	22.47	46.8	64.99	89.0
Dec. 4.4	22.94	44.5	46.54	22.8	23.95	37.6	22.22	49.4	64.93	90.4
14.3	22.87	44.0	46.46	24.0	23.88	37.6	21.86	51.6	64.83	91.4
24.3	22.77	43.5	46.36	25.1	23.78	37.5	21.42	53.4	64.70	92.0
34.3	22.66	42.8	46.25	26.1	23.67	37.1	20.90	54.7	64.54	92.4

# FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

331

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	<i>α</i> Arietis.				<i>β</i> Trianguli.				<i>ζ</i> <sup>1</sup> Ceti.				<i>γ</i> Trianguli.				67 Ceti.			
	Right Ascension.		Declina- tion North.		Right Ascension.		Declina- tion North.		Right Ascension.		Declina- tion North.		Right Ascension.		Declina- tion North.		Right Ascension.		Declina- tion South.	
	h	m	°	'	h	m	°	'	h	m	°	'	h	m	°	'	h	m	°	'
	2	1	+23	0	2	3	+34	31	2	7	+8	23	2	11	+33	24	2	12	-6	51
	s		"		s		"		s		"		s		"		s		"	
Jan. 0.3	46.40		32.9		50.76		65.1		55.30		44.0		37.34		16.4		12.21		60.4	
10.3	46.28	.12	32.5	.4	50.61	.15	65.1	.0	55.19	.11	43.3	.7	37.20	.14	16.4	.0	12.10	.11	61.3	.9
20.3	46.13	.15	32.0	.5	50.44	.17	64.8	.3	55.06	.13	42.7	.6	37.04	.16	16.1	.3	11.96	.14	62.1	.8
30.3	45.98	.15	31.4	.6	50.26	.18	64.2	.6	54.91	.15	42.0	.7	36.86	.18	15.5	.6	11.82	.14	62.7	.6
Feb. 9.2	45.81	.17	30.6	.8	50.07	.19	63.3	.9	54.77	.14	41.4	.6	36.67	.19	14.7	.8	11.67	.15	63.1	.4
		.15		1.0		.18		1.1		.15		.6		.18		1.0		.15		.2
19.2	45.66		29.6		49.89		62.2		54.62		40.8		36.49		13.7		11.52		63.3	
29.2	45.51	.15	28.7	.9	49.72	.17	61.0	1.2	54.48	.14	40.3	.5	36.31	.18	12.5	1.2	11.38	.14	63.2	.1
Mar. 10.1	45.38	.13	27.7	1.0	49.57	.15	59.6	1.4	54.36	.12	39.9	.4	36.16	.15	11.2	1.3	11.26	.12	63.0	.2
20.1	45.29	.09	26.7	1.0	49.46	.11	58.1	1.5	54.27	.09	39.7	.2	36.04	.12	9.9	1.3	11.16	.10	62.5	.5
30.1	45.23	.06	25.8	.9	49.39	.07	56.7	1.4	54.21	.06	39.6	.1	35.97	.07	8.5	1.4	11.09	.07	61.8	.7
		.02		.7		.02		1.4		.02		.1		.03		1.3		.03		1.0
Apr. 9.0	45.21		25.1		49.37		55.3		54.19		39.7		35.94		7.2		11.06		60.8	
19.0	45.24	.03	24.5	.6	49.40	.03	54.1	1.2	54.21	.02	40.0	.3	35.96	.02	6.1	1.1	11.07	.01	59.6	1.2
29.0	45.32	.08	24.2	.3	49.48	.08	53.1	1.0	54.28	.07	40.6	.6	36.03	.07	5.1	1.0	11.13	.06	58.2	1.4
May 9.0	45.45	.13	24.1	.1	49.62	.14	52.4	.7	54.39	.11	41.3	.7	36.16	.13	4.4	.7	11.23	.10	56.5	1.7
18.9	45.63	.18	24.3	.2	49.81	.19	51.9	.5	54.54	.15	42.3	1.0	36.34	.18	4.0	.4	11.37	.14	54.7	1.8
		.22		.5		.23		.2		.20		1.2		.23		.2		.19		1.9
28.9	45.85		24.8		50.04		51.7		54.74		43.5		36.57		3.8		11.56		52.8	
June 7.9	46.10	.25	25.5	.7	50.32	.28	51.9	.2	54.97	.23	44.9	1.4	36.83	.26	4.0	.2	11.78	.22	50.8	2.0
17.9	46.38	.28	26.5	1.0	50.63	.31	52.4	.5	55.23	.26	46.4	1.5	37.13	.30	4.5	.5	12.03	.25	48.7	2.1
27.8	46.69	.31	27.7	1.2	50.96	.33	53.2	.8	55.51	.28	48.1	1.7	37.46	.33	5.3	.8	12.31	.28	46.6	2.1
July 7.8	47.01	.32	29.1	1.4	51.31	.35	54.3	1.1	55.81	.30	49.8	1.7	37.80	.34	6.4	1.1	12.60	.29	44.6	2.0
		.32		1.6		.35		1.4		.30		1.8		.35		1.3		.29		1.9
17.8	47.33		30.7		51.66		55.7		56.11		51.6		38.15		7.7		12.89		42.7	
27.7	47.65	.32	32.4	1.7	52.01	.35	57.2	1.5	56.41	.30	53.3	1.7	38.50	.35	9.2	1.5	13.19	.30	41.0	1.7
Aug. 6.7	47.96	.31	34.1	1.7	52.35	.34	59.0	1.8	56.71	.30	54.9	1.6	38.84	.34	10.9	1.7	13.48	.29	39.5	1.5
16.7	48.25	.29	35.9	1.8	52.67	.32	60.9	1.9	56.99	.28	56.5	1.6	39.16	.32	12.7	1.8	13.76	.28	38.2	1.3
26.7	48.52	.27	37.6	1.7	52.97	.30	62.8	1.9	57.25	.26	57.8	1.3	39.46	.30	14.6	1.9	14.02	.26	37.3	.9
		.25		1.7		.27		2.0		.23		1.2		.27		1.9		.24		.6
Sept. 5.6	48.77		39.3		53.24		64.8		57.48		59.0		39.73		16.5		14.26		36.7	
15.6	48.99	.22	40.9	1.6	53.48	.24	66.9	2.1	57.69	.21	60.0	1.0	39.97	.24	18.4	1.9	14.47	.21	36.4	.3
25.6	49.17	.18	42.4	1.5	53.69	.21	68.8	1.9	57.87	.18	60.7	.7	40.19	.22	20.3	1.9	14.65	.18	36.4	.0
Oct. 5.6	49.33	.16	43.7	1.3	53.86	.17	70.8	2.0	58.02	.15	61.3	.6	40.37	.18	22.1	1.8	14.80	.15	36.7	.3
15.5	49.45	.12	44.9	1.2	54.00	.14	72.6	1.8	58.14	.12	61.6	.3	40.51	.14	23.9	1.8	14.92	.12	37.3	.6
		.09		1.0		.10		1.7		.09		.1		.11		1.6		.08		.8
25.5	49.54		45.9		54.10		74.3		58.23		61.7		40.62		25.5		15.00		38.1	
Nov. 4.5	49.60	.06	46.8	.9	54.17	.07	75.8	1.5	58.29	.06	61.7	.0	40.70	.08	26.9	1.4	15.06	.06	39.1	1.0
14.4	49.63	.03	47.4	.6	54.20	.03	77.2	1.4	58.32	.03	61.5	.2	40.74	.04	28.2	1.3	15.09	.03	40.2	1.1
24.4	49.63	.00	48.0	.6	54.19	.01	78.3	1.1	58.33	.01	61.1	.4	40.74	.00	29.3	1.1	15.09	.00	41.4	1.2
Dec. 4.4	49.59	.04	48.3	.1	54.15	.04	79.3	1.0	58.29	.04	60.7	.5	40.71	.03	30.2	.9	15.06	.03	42.6	1.2
		.06				.07		.7		.05				.07		.7		.06		1.1
14.4	49.53		48.4		54.08		80.0		58.24		60.2		40.64		30.9		15.00		43.7	
24.3	49.44	.09	48.4	.0	53.97	.11	80.4	.4	58.16	.08	59.6	.6	40.55	.09	31.3	.4	14.92	.08	44.8	1.1
34.3	49.33	.11	48.2	.2	53.84	.13	80.6	.2	58.06	.10	59.0	.6	40.42	.13	31.5	.2	14.82	.10	45.8	1.0

## FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\delta$ Hydri.		$\gamma$ Cassiopeiæ.		$\xi^2$ Ceti.		$\mu$ Hydri.		$\delta$ Ceti.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.
	h m 2 19	° ' s -69 5	h m 2 21	° ' s +66 58	h m 2 23	° ' s + 8 1	h m 2 33	° ' s -79 31	h m 2 34	° ' s - 0 4
	s	"	s	"	s	"	s	"	s	"
Jan. 0.3	62.59	69.0	11.76	26.8	3.96	43.8	42.36	65.4	34.40	74.3
10.3	62.05	70.0	11.37	27.9	3.85	43.2	41.21	66.3	34.29	75.2
20.3	61.48	70.3	10.93	28.5	3.72	42.5	40.00	66.7	34.16	75.9
30.2	60.90	70.1	10.46	28.5	3.58	41.9	38.76	66.4	34.02	76.5
Feb. 9.2	60.32	69.2	9.98	27.9	3.43	41.3	37.53	65.6	33.87	77.0
19.2	59.76	67.8	9.51	26.9	3.28	40.8	36.34	64.2	33.71	77.4
29.2	59.25	65.9	9.07	25.4	3.13	40.3	35.22	62.3	33.57	77.6
Mar. 10.1	58.78	63.6	8.68	23.4	3.00	40.0	34.20	59.9	33.43	77.7
20.1	58.38	60.8	8.37	21.1	2.90	39.7	33.30	57.1	33.31	77.5
30.1	58.06	57.7	8.14	18.7	2.82	39.7	32.55	54.0	33.23	77.2
Apr. 9.1	57.82	54.3	8.01	16.0	2.79	39.8	31.96	50.6	33.18	76.6
19.0	57.68	50.7	7.99	13.4	2.79	40.1	31.56	47.1	33.17	75.8
29.0	57.65	47.1	8.08	10.9	2.85	40.6	31.34	43.4	33.21	74.8
May 9.0	57.72	43.4	8.27	8.5	2.94	41.4	31.32	39.7	33.29	73.6
18.9	57.89	39.7	8.57	6.4	3.08	42.4	31.50	36.1	33.42	72.2
28.9	58.16	36.2	8.96	4.6	3.27	43.6	31.87	32.6	33.59	70.6
June 7.9	58.52	32.0	9.44	3.2	3.49	44.9	32.42	29.4	33.80	68.9
17.9	58.97	30.0	9.98	2.2	3.74	46.4	33.15	26.4	34.04	67.1
27.8	59.50	27.4	10.58	1.7	4.02	48.0	34.03	23.8	34.30	65.3
July 7.8	60.08	25.2	11.21	1.6	4.31	49.8	35.03	21.7	34.58	63.4
17.8	60.70	23.5	11.86	2.0	4.61	51.5	36.14	20.1	34.87	61.6
27.8	61.35	22.4	12.52	2.9	4.91	53.1	37.31	19.0	35.17	59.9
Aug. 6.7	62.00	21.9	13.16	4.2	5.21	54.7	38.51	18.5	35.46	58.3
16.7	62.65	22.0	13.79	5.9	5.49	56.2	39.71	18.6	35.75	56.9
26.7	63.25	22.6	14.38	7.9	5.75	57.6	40.87	19.3	36.02	55.8
Sept. 5.6	63.81	23.9	14.92	10.3	6.00	58.7	41.95	20.6	36.26	55.0
15.6	64.31	25.8	15.41	12.9	6.22	59.6	42.91	22.4	36.49	54.4
25.6	64.72	28.1	15.84	15.7	6.41	60.3	43.72	24.8	36.69	54.1
Oct. 5.6	65.04	30.8	16.21	18.7	6.58	60.8	44.36	27.5	36.86	54.0
15.5	65.25	33.8	16.50	21.8	6.71	61.1	44.80	30.6	37.00	54.3
25.5	65.36	37.0	16.71	25.0	6.82	61.1	45.02	33.8	37.11	54.7
Nov. 4.5	65.36	40.2	16.84	28.1	6.89	61.0	45.02	37.1	37.19	55.3
14.5	65.25	43.4	16.89	31.1	6.94	60.8	44.79	40.3	37.25	56.1
24.4	65.04	46.5	16.85	33.9	6.95	60.4	44.36	43.4	37.27	56.9
Dec. 4.4	64.74	49.2	16.73	36.5	6.94	59.9	43.72	46.1	37.26	57.8
14.4	64.35	51.5	16.52	38.8	6.90	59.4	42.90	48.5	37.23	58.8
24.3	63.90	53.3	16.24	40.6	6.83	58.8	41.94	50.4	37.16	59.7
34.3	63.39	54.6	15.88	42.0	6.73	58.2	40.86	51.7	37.07	60.5



(CONSTANTS OF STRUVE AND PETERS.)

333

### APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	θ Persei.		γ Ceti.		α Arietis.		47 Cephei (H.)		ε Arietis.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 2 37	° ' +48 49	h m 2 38	° ' + 2 49	h m 2 46	° ' +14 41	h m 2 53	° ' +79 2	h m 2 53	° ' +20 57
	s "	"	s "	"	s "	"	s "	"	s "	"
Jan. 0-3	40.02	28.2	20.29	46.9	12.39	8.9	24.54	33.2	44.29	22.1
10-3	39.84	28.8	20.18	46.1	12.29	8.4	23.73	35.0	44.19	21.9
20-3	39.62	29.1	20.06	45.4	12.16	7.9	22.80	36.2	44.06	21.6
30-3	39.38	29.0	19.92	44.8	12.01	7.3	21.78	36.9	43.91	21.1
Feb. 9-2	39.12	28.5	19.76	44.2	11.86	6.7	20.72	37.0	43.74	20.6
	38.86	27.6	19.61	43.8	11.69	6.2	19.65	36.4	43.57	20.0
	38.61	26.3	19.46	43.5	11.53	5.6	18.62	35.3	43.40	19.3
Mar. 10-2	38.38	24.8	19.32	43.3	11.39	5.0	17.68	33.7	43.24	18.6
20-1	38.19	23.1	19.20	43.3	11.26	4.5	16.87	31.6	43.11	17.8
30-1	38.06	21.2	19.11	43.5	11.17	4.1	16.23	29.1	43.01	17.2
Apr. 9-1	37.98	19.3	19.06	43.9	11.11	3.9	15.77	26.4	42.94	16.6
19-0	37.96	17.4	19.05	44.5	11.09	3.8	15.52	23.6	42.92	16.2
29-0	38.01	15.6	19.09	45.3	11.12	3.9	15.48	20.7	42.94	15.9
May 9-0	38.12	14.0	19.17	46.4	11.20	4.2	15.67	17.8	43.02	15.8
19-0	38.30	12.6	19.29	47.6	11.33	4.8	16.07	15.1	43.14	16.0
June 28-9	38.55	11.5	19.46	49.0	11.50	5.5	16.67	12.7	43.31	16.3
7-9	38.85	10.8	19.66	50.6	11.71	6.5	17.44	10.6	43.52	16.9
17-9	39.19	10.4	19.90	52.3	11.95	7.6	18.38	8.9	43.77	17.7
27-9	39.57	10.3	20.16	54.0	12.22	8.9	19.44	7.6	44.04	18.7
July 7-8	39.97	10.7	20.45	55.8	12.51	10.3	20.59	6.8	44.34	19.9
17-8	40.39	11.4	20.74	57.6	12.81	11.8	21.82	6.4	44.65	21.2
27-8	40.81	12.4	21.04	59.2	13.12	13.3	23.09	6.6	44.96	22.6
Aug. 6-7	41.23	13.7	21.33	60.8	13.42	14.9	24.38	7.2	45.28	24.0
16-7	41.64	15.3	21.61	62.2	13.72	16.3	25.65	8.3	45.58	25.5
26-7	42.03	17.1	21.88	63.4	14.00	17.7	26.88	9.8	45.88	26.9
Sept. 5-7	42.39	19.1	22.13	64.3	14.26	19.0	28.05	11.8	46.15	28.3
15-6	42.72	21.2	22.36	65.0	14.50	20.1	29.13	14.1	46.40	29.6
25-6	43.01	23.5	22.56	65.4	14.72	21.0	30.11	16.8	46.63	30.7
Oct. 5-6	43.27	25.8	22.74	65.6	14.91	21.8	30.97	19.7	46.84	31.8
15-6	43.48	28.1	22.88	65.5	15.07	22.4	31.68	22.9	47.01	32.7
Nov. 25-5	43.65	30.5	23.00	65.3	15.20	22.8	32.24	26.2	47.16	33.4
4-5	43.78	32.8	23.09	64.8	15.30	23.1	32.63	29.6	47.27	34.1
14-5	43.86	34.9	23.14	64.2	15.37	23.2	32.84	33.0	47.35	34.6
24-4	43.89	36.9	23.17	63.5	15.42	23.2	32.86	36.3	47.40	34.9
Dec. 4-4	43.88	38.7	23.17	62.8	15.43	23.1	32.68	39.5	47.42	35.2
14-4	43.81	40.2	23.14	62.0	15.40	22.8	32.31	42.4	47.40	35.3
24-4	43.69	41.5	23.08	61.1	15.35	22.5	31.76	45.0	47.35	35.3
34-3	43.54	42.4	22.99	60.4	15.26	22.2	31.04	47.1	47.27	35.2

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Ceti.		$\beta$ Persei.		48 Cephei (H.).		$\zeta$ Arietis.		$\alpha$ Persei.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 2 57	° ' " + 3 42	h m 3 1	° ' " + 40 34	h m 3 8	° ' " + 77 22	h m 3 9	° ' " + 20 41	h m 3 17	° ' " + 49 30
Jan. 0.4	16.48 <sup>s</sup>	41.3 <sup>s</sup>	56.67 <sup>s</sup>	72.9 <sup>s</sup>	13.07 <sup>s</sup>	65.5 <sup>s</sup>	24.01 <sup>s</sup>	17.5 <sup>s</sup>	29.81 <sup>s</sup>	75.1 <sup>s</sup>
10.3	16.38 <sup>.10</sup>	40.5 <sup>.08</sup>	56.54 <sup>.13</sup>	73.5 <sup>.06</sup>	12.42 <sup>.65</sup>	67.4 <sup>.19</sup>	23.92 <sup>.09</sup>	17.3 <sup>.02</sup>	29.66 <sup>.15</sup>	76.1 <sup>.10</sup>
20.3	16.26 <sup>.12</sup>	39.8 <sup>.07</sup>	56.37 <sup>.17</sup>	73.7 <sup>.02</sup>	11.65 <sup>.77</sup>	68.8 <sup>.14</sup>	23.80 <sup>.12</sup>	17.0 <sup>.03</sup>	29.46 <sup>.20</sup>	76.8 <sup>.07</sup>
30.3	16.12 <sup>.14</sup>	39.2 <sup>.06</sup>	56.17 <sup>.20</sup>	73.7 <sup>.00</sup>	10.80 <sup>.85</sup>	69.7 <sup>.09</sup>	23.65 <sup>.15</sup>	16.6 <sup>.04</sup>	29.23 <sup>.23</sup>	77.1 <sup>.03</sup>
Feb. 9.2	15.97 <sup>.15</sup>	38.6 <sup>.06</sup>	55.96 <sup>.21</sup>	73.3 <sup>.04</sup>	9.89 <sup>.91</sup>	69.9 <sup>.02</sup>	23.49 <sup>.16</sup>	16.1 <sup>.05</sup>	28.97 <sup>.26</sup>	77.0 <sup>.01</sup>
	15.81 <sup>.16</sup>	38.2 <sup>.04</sup>	55.73 <sup>.23</sup>	72.7 <sup>.06</sup>	8.96 <sup>.93</sup>	69.5 <sup>.04</sup>	23.31 <sup>.18</sup>	15.6 <sup>.05</sup>	28.70 <sup>.27</sup>	76.5 <sup>.05</sup>
19.2	15.81 <sup>.16</sup>	38.2 <sup>.03</sup>	55.73 <sup>.22</sup>	72.7 <sup>.10</sup>	8.96 <sup>.90</sup>	69.5 <sup>.09</sup>	23.31 <sup>.17</sup>	15.6 <sup>.06</sup>	28.70 <sup>.28</sup>	76.5 <sup>.08</sup>
29.2	15.65 <sup>.15</sup>	37.9 <sup>.02</sup>	55.51 <sup>.20</sup>	71.7 <sup>.11</sup>	8.06 <sup>.84</sup>	68.6 <sup>.15</sup>	23.14 <sup>.16</sup>	15.0 <sup>.07</sup>	28.42 <sup>.25</sup>	75.7 <sup>.12</sup>
Mar. 10.2	15.50 <sup>.13</sup>	37.7 <sup>.00</sup>	55.31 <sup>.18</sup>	70.6 <sup>.13</sup>	7.22 <sup>.74</sup>	67.1 <sup>.19</sup>	22.98 <sup>.15</sup>	14.3 <sup>.06</sup>	28.17 <sup>.23</sup>	74.5 <sup>.14</sup>
20.1	15.37 <sup>.10</sup>	37.7 <sup>.01</sup>	55.13 <sup>.14</sup>	69.3 <sup>.15</sup>	6.48 <sup>.61</sup>	65.2 <sup>.23</sup>	22.83 <sup>.12</sup>	13.7 <sup>.06</sup>	27.94 <sup>.19</sup>	73.1 <sup>.16</sup>
30.1	15.27 <sup>.07</sup>	37.8 <sup>.03</sup>	54.99 <sup>.10</sup>	67.8 <sup>.15</sup>	5.87 <sup>.44</sup>	62.9 <sup>.26</sup>	22.71 <sup>.08</sup>	13.1 <sup>.06</sup>	27.75 <sup>.14</sup>	71.5 <sup>.18</sup>
Apr. 9.1	15.20 <sup>.03</sup>	38.1 <sup>.06</sup>	54.89 <sup>.04</sup>	66.3 <sup>.14</sup>	5.43 <sup>.27</sup>	60.3 <sup>.27</sup>	22.63 <sup>.04</sup>	12.5 <sup>.04</sup>	27.61 <sup>.07</sup>	69.7 <sup>.18</sup>
19.1	15.17 <sup>.02</sup>	38.7 <sup>.07</sup>	54.85 <sup>.02</sup>	64.9 <sup>.14</sup>	5.16 <sup>.03</sup>	57.6 <sup>.29</sup>	22.59 <sup>.01</sup>	12.1 <sup>.03</sup>	27.54 <sup>.01</sup>	67.9 <sup>.18</sup>
29.0	15.19 <sup>.06</sup>	39.4 <sup>.09</sup>	54.87 <sup>.08</sup>	63.5 <sup>.12</sup>	5.08 <sup>.11</sup>	54.7 <sup>.28</sup>	22.60 <sup>.06</sup>	11.8 <sup>.01</sup>	27.53 <sup>.06</sup>	66.1 <sup>.17</sup>
May 9.0	15.25 <sup>.11</sup>	40.3 <sup>.12</sup>	54.95 <sup>.13</sup>	62.3 <sup>.10</sup>	5.19 <sup>.30</sup>	51.9 <sup>.27</sup>	22.66 <sup>.11</sup>	11.7 <sup>.01</sup>	27.59 <sup>.13</sup>	64.4 <sup>.16</sup>
19.0	15.36 <sup>.15</sup>	41.5 <sup>.13</sup>	55.08 <sup>.19</sup>	61.3 <sup>.08</sup>	5.49 <sup>.47</sup>	49.2 <sup>.25</sup>	22.77 <sup>.15</sup>	11.8 <sup>.04</sup>	27.72 <sup>.20</sup>	62.8 <sup>.13</sup>
28.9	15.51 <sup>.19</sup>	42.8 <sup>.15</sup>	55.27 <sup>.25</sup>	60.5 <sup>.05</sup>	5.96 <sup>.64</sup>	46.7 <sup>.21</sup>	22.92 <sup>.20</sup>	12.2 <sup>.05</sup>	27.92 <sup>.25</sup>	61.5 <sup>.10</sup>
June 7.9	15.70 <sup>.23</sup>	44.3 <sup>.16</sup>	55.52 <sup>.28</sup>	60.0 <sup>.02</sup>	6.60 <sup>.78</sup>	44.6 <sup>.19</sup>	23.12 <sup>.23</sup>	12.7 <sup>.07</sup>	28.17 <sup>.31</sup>	60.5 <sup>.08</sup>
17.9	15.93 <sup>.25</sup>	45.9 <sup>.17</sup>	55.80 <sup>.32</sup>	59.8 <sup>.01</sup>	7.38 <sup>.90</sup>	42.7 <sup>.14</sup>	23.35 <sup>.27</sup>	13.4 <sup>.09</sup>	28.48 <sup>.35</sup>	59.7 <sup>.04</sup>
27.9	16.18 <sup>.28</sup>	47.6 <sup>.17</sup>	56.12 <sup>.35</sup>	59.9 <sup>.04</sup>	8.28 <sup>.100</sup>	41.3 <sup>.10</sup>	23.62 <sup>.29</sup>	14.3 <sup>.11</sup>	28.83 <sup>.38</sup>	59.3 <sup>.01</sup>
July 7.8	16.46 <sup>.29</sup>	49.3 <sup>.17</sup>	56.47 <sup>.36</sup>	60.3 <sup>.06</sup>	9.28 <sup>.107</sup>	40.3 <sup>.05</sup>	23.91 <sup>.30</sup>	15.4 <sup>.13</sup>	29.21 <sup>.41</sup>	59.2 <sup>.02</sup>
17.8	16.75 <sup>.29</sup>	51.0 <sup>.16</sup>	56.83 <sup>.38</sup>	60.9 <sup>.09</sup>	10.35 <sup>.112</sup>	39.8 <sup>.00</sup>	24.21 <sup>.31</sup>	16.7 <sup>.13</sup>	29.62 <sup>.43</sup>	59.4 <sup>.05</sup>
27.8	17.04 <sup>.29</sup>	52.6 <sup>.16</sup>	57.21 <sup>.37</sup>	61.8 <sup>.12</sup>	11.47 <sup>.113</sup>	39.8 <sup>.05</sup>	24.52 <sup>.32</sup>	18.0 <sup>.13</sup>	30.05 <sup>.42</sup>	59.9 <sup>.09</sup>
Aug. 6.8	17.33 <sup>.29</sup>	54.2 <sup>.13</sup>	57.58 <sup>.37</sup>	63.0 <sup>.14</sup>	12.60 <sup>.113</sup>	40.3 <sup>.09</sup>	24.84 <sup>.31</sup>	19.3 <sup>.14</sup>	30.47 <sup>.43</sup>	60.8 <sup>.11</sup>
16.7	17.62 <sup>.28</sup>	55.5 <sup>.12</sup>	57.95 <sup>.35</sup>	64.4 <sup>.15</sup>	13.73 <sup>.111</sup>	41.2 <sup>.13</sup>	25.15 <sup>.29</sup>	20.7 <sup>.13</sup>	30.90 <sup>.41</sup>	61.9 <sup>.13</sup>
26.7	17.90 <sup>.26</sup>	56.7 <sup>.09</sup>	58.30 <sup>.34</sup>	65.9 <sup>.17</sup>	14.84 <sup>.106</sup>	42.5 <sup>.18</sup>	25.44 <sup>.28</sup>	22.0 <sup>.13</sup>	31.31 <sup>.40</sup>	63.2 <sup>.16</sup>
Sept. 5.7	18.16 <sup>.24</sup>	57.6 <sup>.07</sup>	58.64 <sup>.31</sup>	67.6 <sup>.17</sup>	15.90 <sup>.099</sup>	44.3 <sup>.21</sup>	25.72 <sup>.27</sup>	23.3 <sup>.12</sup>	31.71 <sup>.37</sup>	64.8 <sup>.18</sup>
15.6	18.40 <sup>.21</sup>	58.3 <sup>.05</sup>	58.95 <sup>.28</sup>	69.3 <sup>.18</sup>	16.89 <sup>.091</sup>	46.4 <sup>.25</sup>	25.99 <sup>.24</sup>	24.5 <sup>.11</sup>	32.08 <sup>.34</sup>	66.6 <sup>.19</sup>
25.6	18.61 <sup>.20</sup>	58.8 <sup>.02</sup>	59.23 <sup>.26</sup>	71.1 <sup>.19</sup>	17.80 <sup>.081</sup>	48.9 <sup>.27</sup>	26.23 <sup>.21</sup>	25.6 <sup>.09</sup>	32.42 <sup>.31</sup>	68.5 <sup>.20</sup>
Oct. 5.6	18.81 <sup>.16</sup>	59.0 <sup>.00</sup>	59.49 <sup>.22</sup>	73.0 <sup>.18</sup>	18.61 <sup>.070</sup>	51.6 <sup>.30</sup>	26.44 <sup>.19</sup>	26.5 <sup>.08</sup>	32.73 <sup>.28</sup>	70.5 <sup>.21</sup>
15.6	18.97 <sup>.13</sup>	59.0 <sup>.03</sup>	59.71 <sup>.18</sup>	74.8 <sup>.18</sup>	19.31 <sup>.056</sup>	54.6 <sup>.32</sup>	26.63 <sup>.16</sup>	27.3 <sup>.07</sup>	33.01 <sup>.23</sup>	72.6 <sup>.22</sup>
25.5	19.10 <sup>.11</sup>	58.7 <sup>.04</sup>	59.89 <sup>.15</sup>	76.6 <sup>.17</sup>	19.87 <sup>.042</sup>	57.8 <sup>.33</sup>	26.79 <sup>.13</sup>	28.0 <sup>.06</sup>	33.24 <sup>.19</sup>	74.8 <sup>.21</sup>
Nov. 4.5	19.21 <sup>.08</sup>	58.3 <sup>.06</sup>	60.04 <sup>.11</sup>	78.3 <sup>.17</sup>	20.29 <sup>.026</sup>	61.1 <sup>.33</sup>	26.92 <sup>.10</sup>	28.6 <sup>.05</sup>	33.43 <sup>.14</sup>	76.9 <sup>.21</sup>
14.5	19.29 <sup>.05</sup>	57.7 <sup>.07</sup>	60.15 <sup>.06</sup>	80.0 <sup>.15</sup>	20.55 <sup>.009</sup>	64.4 <sup>.33</sup>	27.02 <sup>.07</sup>	29.1 <sup>.03</sup>	33.57 <sup>.10</sup>	79.0 <sup>.21</sup>
24.5	19.34 <sup>.01</sup>	57.0 <sup>.08</sup>	60.21 <sup>.03</sup>	81.5 <sup>.14</sup>	20.64 <sup>.007</sup>	67.7 <sup>.32</sup>	27.09 <sup>.04</sup>	29.4 <sup>.02</sup>	33.67 <sup>.04</sup>	81.1 <sup>.19</sup>
Dec. 4.4	19.35 <sup>.01</sup>	56.2 <sup>.08</sup>	60.24 <sup>.03</sup>	82.9 <sup>.12</sup>	20.57 <sup>.025</sup>	70.9 <sup>.29</sup>	27.13 <sup>.01</sup>	29.6 <sup>.01</sup>	33.71 <sup>.02</sup>	83.0 <sup>.17</sup>
14.4	19.34 <sup>.05</sup>	55.4 <sup>.08</sup>	60.21 <sup>.06</sup>	84.1 <sup>.10</sup>	20.32 <sup>.041</sup>	73.8 <sup>.26</sup>	27.12 <sup>.04</sup>	29.7 <sup>.00</sup>	33.69 <sup>.06</sup>	84.7 <sup>.15</sup>
24.4	19.29 <sup>.08</sup>	54.6 <sup>.07</sup>	60.15 <sup>.11</sup>	85.1 <sup>.08</sup>	19.91 <sup>.056</sup>	76.4 <sup>.22</sup>	27.08 <sup>.07</sup>	29.7 <sup>.01</sup>	33.63 <sup>.13</sup>	86.2 <sup>.12</sup>
34.3	19.21 <sup></sup>	53.9 <sup></sup>	60.04 <sup></sup>	85.9 <sup></sup>	19.35 <sup></sup>	78.6 <sup></sup>	27.01 <sup></sup>	29.6 <sup></sup>	33.50 <sup></sup>	87.4 <sup></sup>

# FIXED STARS, 1904.

335

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	Hydri.			/ Tauri.			Eridani.			δ Persei.			γ Camelopardalis.		
	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.
	h	m	°	h	m	°	h	m	°	h	m	°	h	m	°
	3	18	-77 44	3	25	+12 36	3	28	- 9 46	3	36	+47 28	3	40	+71 1
	s	"	"	s	"	"	s	"	"	s	"	"	s	"	"
Jan. 0.4	22.57	0.90	43.9	35.39	0.08	23.3	25.35	0.09	69.7	7.08	53.4	1.0	17.10	0.33	77.6
10.3	21.67	0.99	45.5	35.31	0.11	22.8	25.26	0.12	71.0	6.96	54.4	0.8	16.77	0.44	79.6
20.3	20.68	1.06	46.6	35.20	0.13	22.4	25.14	0.14	72.0	6.78	55.2	0.4	16.33	0.51	81.2
30.3	19.62	1.08	47.1	35.07	0.16	21.9	25.00	0.16	72.8	6.57	55.6	0.0	15.82	0.57	82.3
Feb. 9.3	18.54	1.09	46.9	34.91	0.17	21.4	24.84	0.18	73.4	6.33	55.6	0.3	15.25	0.60	82.8
19.2	17.45	1.05	46.2	34.74	0.17	21.0	24.66	0.18	73.8	6.07	55.3	0.6	14.65	0.61	82.8
29.2	16.40	1.00	45.0	34.57	0.16	20.5	24.48	0.17	73.9	5.80	54.7	1.0	14.04	0.59	82.3
Mar. 10.2	15.40	0.92	43.2	34.41	0.15	20.1	24.31	0.15	73.7	5.55	53.7	1.2	13.45	0.53	81.3
20.2	14.48	0.81	41.0	34.26	0.13	19.8	24.16	0.14	73.3	5.31	52.5	1.4	12.92	0.45	79.7
30.1	13.67	0.69	38.4	34.13	0.09	19.5	24.02	0.10	72.6	5.12	51.1	1.6	12.47	0.36	77.8
Apr. 9.1	12.98	0.54	35.4	34.04	0.05	19.4	23.92	0.06	71.6	4.97	49.5	1.7	12.11	0.25	75.6
19.1	12.44	0.39	32.2	33.99	0.01	19.5	23.86	0.02	70.4	4.87	47.8	1.6	11.86	0.13	73.1
29.0	12.05	0.22	28.7	33.98	0.04	19.7	23.84	0.02	69.0	4.84	46.2	1.6	11.73	0.01	70.6
May 9.0	11.83	0.05	25.1	34.02	0.09	20.0	23.86	0.07	67.4	4.88	44.6	1.5	11.74	0.14	68.0
19.0	11.78	0.13	21.5	34.11	0.13	20.6	23.93	0.11	65.6	4.98	43.1	1.3	11.88	0.26	65.4
29.0	11.91	0.29	17.9	34.24	0.18	21.3	24.04	0.16	63.6	5.15	41.8	1.1	12.14	0.38	63.0
June 7.9	12.20	0.46	14.5	34.42	0.21	22.3	24.20	0.19	61.5	5.37	40.7	0.8	12.52	0.49	60.9
17.9	12.66	0.61	11.2	34.63	0.24	23.3	24.39	0.22	59.4	5.65	39.9	0.5	13.01	0.58	59.0
27.9	13.27	0.74	8.2	34.87	0.27	24.5	24.61	0.25	57.2	5.97	39.4	0.2	13.59	0.65	57.4
July 7.9	14.01	0.86	5.7	35.14	0.29	25.9	24.86	0.28	55.1	6.33	39.2	0.1	14.24	0.72	56.3
17.8	14.87	0.95	3.5	35.43	0.29	27.2	25.14	0.28	53.1	6.72	39.3	0.4	14.96	0.76	55.5
27.8	15.82	1.00	1.8	35.72	0.30	28.6	25.42	0.29	51.3	7.12	39.7	0.6	15.72	0.78	55.2
Aug. 6.8	16.82	1.04	0.7	36.02	0.30	30.0	25.71	0.28	49.7	7.53	40.3	1.0	16.50	0.79	55.3
16.7	17.86	1.04	0.2	36.32	0.29	31.3	25.99	0.28	48.4	7.94	41.3	1.1	17.29	0.79	55.8
26.7	18.90	1.00	0.3	36.61	0.28	32.5	26.27	0.27	47.4	8.35	42.4	1.4	18.08	0.77	56.7
Sept. 5.7	19.90	0.94	1.0	36.89	0.26	33.6	26.54	0.26	46.8	8.74	43.8	1.5	18.85	0.74	58.1
15.7	20.84	0.83	2.3	37.15	0.24	34.5	26.80	0.23	46.5	9.12	45.3	1.7	19.59	0.69	59.8
25.6	21.67	0.71	4.2	37.39	0.22	35.2	27.03	0.21	46.6	9.47	47.0	1.8	20.28	0.64	61.8
Oct. 5.6	22.38	0.56	6.6	37.61	0.19	35.7	27.24	0.19	47.0	9.79	48.8	1.9	20.92	0.57	64.1
15.6	22.94	0.39	9.4	37.80	0.17	36.1	27.43	0.16	47.8	10.07	50.7	1.9	21.49	0.49	66.6
25.6	23.33	0.20	12.5	37.97	0.14	36.3	27.59	0.13	48.8	10.33	52.6	1.9	21.98	0.40	69.4
Nov. 4.5	23.53	0.02	15.8	38.11	0.11	36.3	27.72	0.09	50.1	10.54	54.5	2.0	22.38	0.30	72.3
14.5	23.55	0.18	19.1	38.22	0.08	36.2	27.81	0.07	51.5	10.71	56.5	1.9	22.68	0.19	75.3
24.5	23.37	0.37	22.4	38.30	0.05	36.0	27.88	0.03	53.0	10.83	58.4	1.8	22.87	0.08	78.3
Dec. 4.4	23.00	0.53	25.5	38.35	0.01	35.7	27.91	0.00	54.6	10.90	60.2	1.6	22.95	0.04	81.2
14.4	22.47	0.70	28.3	38.36	0.02	35.4	27.91	0.03	56.2	10.91	61.8	1.5	22.91	0.16	84.0
24.4	21.77	0.82	30.7	38.34	0.06	35.0	27.88	0.07	57.6	10.87	63.3	1.2	22.75	0.27	86.6
34.4	20.95		32.7	38.28		34.5	27.81		58.9	10.78	64.5		22.48		88.9

# FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\eta$ Tauri.		$\zeta$ Persei.		$\gamma$ Hydri.		$\epsilon$ Persei.		$\gamma$ Eridani.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.
	h m 3 41	° ' " +23 48	h m 3 48	° ' " +31 35	h m 3 48	° ' " -74 31	h m 3 51	° ' " +39 43	h m 3 53	° ' " -13 46
Jan. 0.4	47.86	27.4	7.18	53.9	45.65	81.2	26.26	57.7	34.05	65.4
10.3	47.79	27.5	7.10	54.3	45.01	83.3	26.17	58.5	33.97	66.9
20.3	47.68	27.4	6.99	54.5	44.27	84.9	26.04	59.0	33.86	68.1
30.3	47.54	27.2	6.84	54.6	43.47	85.9	25.87	59.4	33.72	69.1
Feb. 9.3	47.38	26.9	6.66	54.4	42.62	86.3	25.66	59.4	33.56	69.9
19.2	47.20	26.5	6.46	54.1	41.75	86.1	25.44	59.2	33.38	70.3
29.2	47.01	26.0	6.26	53.6	40.88	85.4	25.21	58.7	33.19	70.4
Mar. 10.2	46.83	25.4	6.06	53.0	40.04	84.1	24.98	58.0	33.01	70.3
20.2	46.66	24.8	5.87	52.2	39.25	82.3	24.77	57.0	32.84	69.8
30.1	46.51	24.2	5.71	51.3	38.53	80.1	24.59	55.9	32.69	69.1
Apr. 9.1	46.40	23.6	5.59	50.4	37.90	77.5	24.45	54.7	32.57	68.1
19.1	46.33	23.0	5.51	49.5	37.38	74.5	24.35	53.4	32.48	66.8
29.1	46.31	22.6	5.48	48.6	36.98	71.2	24.31	52.2	32.43	65.2
May 9.0	46.34	22.3	5.50	47.9	36.71	67.8	24.33	51.0	32.43	63.4
19.0	46.42	22.2	5.57	47.3	36.58	64.3	24.41	49.9	32.47	61.5
29.0	46.55	22.2	5.70	46.8	36.58	60.7	24.55	49.0	32.56	59.4
June 7.9	46.72	22.4	5.88	46.6	36.73	57.1	24.73	48.2	32.69	57.1
17.9	46.93	22.8	6.10	46.5	37.02	53.7	24.97	47.7	32.86	54.8
27.9	47.18	23.4	6.36	46.7	37.43	50.5	25.25	47.5	33.07	52.6
July 7.9	47.46	24.2	6.65	47.1	37.96	47.6	25.56	47.5	33.31	50.4
17.8	47.75	25.1	6.96	47.7	38.59	45.1	25.90	47.7	33.57	48.3
27.8	48.06	26.1	7.28	48.4	39.31	43.1	26.26	48.2	33.84	46.4
Aug. 6.8	48.38	27.2	7.62	49.3	40.10	41.6	26.62	48.9	34.13	44.7
16.8	48.69	28.4	7.96	50.3	40.92	40.6	26.99	49.7	34.42	43.4
26.7	49.01	29.5	8.29	51.4	41.76	40.3	27.35	50.7	34.71	42.4
Sept. 5.7	49.31	30.6	8.62	52.6	42.59	40.6	27.71	51.9	34.99	41.7
15.7	49.59	31.7	8.93	53.7	43.38	41.5	28.05	53.2	35.25	41.5
25.6	49.86	32.7	9.22	54.9	44.12	43.0	28.37	54.5	35.50	41.7
Oct. 5.6	50.11	33.6	9.49	56.1	44.77	45.0	28.67	55.9	35.73	42.2
15.6	50.33	34.5	9.73	57.2	45.31	47.6	28.94	57.4	35.94	43.2
25.6	50.53	35.2	9.95	58.3	45.73	50.5	29.19	58.9	36.13	44.4
Nov. 4.5	50.70	35.8	10.14	59.4	46.01	53.7	29.40	60.3	36.28	45.9
14.5	50.84	36.4	10.29	60.4	46.15	57.1	29.57	61.8	36.40	47.6
24.5	50.94	36.8	10.41	61.3	46.13	60.5	29.70	63.2	36.49	49.4
Dec. 4.5	51.01	37.2	10.49	62.1	45.96	63.8	29.79	64.5	36.55	51.3
14.4	51.04	37.5	10.52	62.9	45.64	66.9	29.83	65.7	36.57	53.1
24.4	51.03	37.7	10.52	63.5	45.19	69.6	29.82	66.8	36.55	54.8
34.4	50.98	37.8	10.47	64.0	44.62	72.0	29.76	67.8	36.50	56.4

# FIXED STARS, 1904.

337

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	A <sup>1</sup> Tauri.		ε Persei.		δ <sup>1</sup> Eridani.		γ Tauri.		ε Tauri.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 3 59	° ' " +21 49	h m 4 1	° ' " +47 27	h m 4 7	° ' " - 7 5	h m 4 14	° ' " +15 23	h m 4 23	° ' " +18 57
	s	"	s	"	s	"	s	"	s	"
Jan. 0.4	2.42	7.0	43.36	23.6	11.85	26.5	21.03	39.3	1.95	57.8
10.4	2.36	7.0	43.27	24.8	11.79	27.8	20.98	39.0	1.91	57.6
20.4	2.27	6.9	43.12	25.8	11.69	29.0	20.90	38.6	1.83	57.5
30.3	2.14	6.7	42.92	26.4	11.56	29.9	20.78	38.3	1.71	57.3
Feb. 9.3	1.98	6.5	42.69	26.7	11.41	30.6	20.64	38.0	1.56	57.1
19.3	1.80	6.2	42.43	26.7	11.24	31.1	20.47	37.7	1.39	56.8
29.3	1.61	5.8	42.16	26.3	11.06	31.3	20.28	37.3	1.21	56.5
Mar. 10.2	1.43	5.3	41.90	25.6	10.88	31.3	20.10	37.0	1.02	56.2
20.2	1.25	4.8	41.65	24.6	10.71	31.1	19.93	36.7	0.84	55.8
30.2	1.10	4.3	41.43	23.3	10.56	30.6	19.77	36.4	0.68	55.5
Apr. 9.1	0.98	3.8	41.26	21.9	10.43	29.9	19.65	36.3	0.55	55.2
19.1	0.90	3.4	41.13	20.4	10.34	28.9	19.56	36.2	0.45	54.9
29.1	0.86	3.1	41.07	18.8	10.28	27.7	19.50	36.2	0.39	54.8
May 9.0	0.87	2.9	41.07	17.2	10.27	26.3	19.50	36.3	0.37	54.7
19.0	0.93	2.8	41.14	15.7	10.31	24.8	19.54	36.6	0.41	54.8
29.0	1.04	2.9	41.27	14.3	10.39	23.0	19.63	37.1	0.49	55.0
June 8.0	1.20	3.2	41.46	13.1	10.52	21.1	19.77	37.7	0.62	55.4
17.9	1.39	3.7	41.71	12.2	10.68	19.2	19.94	38.5	0.79	55.9
27.9	1.62	4.3	42.01	11.5	10.88	17.2	20.15	39.3	1.00	56.6
July 7.9	1.88	5.0	42.35	11.0	11.10	15.2	20.39	40.3	1.24	57.3
17.9	2.17	5.9	42.72	10.8	11.35	13.3	20.65	41.3	1.50	58.2
27.8	2.47	6.9	43.11	11.0	11.62	11.6	20.94	42.4	1.79	59.1
Aug. 6.8	2.77	7.9	43.52	11.3	11.90	10.0	21.23	43.5	2.08	60.0
16.8	3.09	8.9	43.93	11.9	12.19	8.6	21.53	44.5	2.39	61.0
26.8	3.39	10.0	44.34	12.8	12.47	7.6	21.83	45.5	2.69	61.9
Sept. 5.7	3.69	11.0	44.74	13.9	12.75	6.8	22.12	46.4	2.99	62.7
15.7	3.98	11.9	45.13	15.1	13.02	6.5	22.40	47.2	3.28	63.5
25.7	4.26	12.7	45.50	16.5	13.27	6.4	22.67	47.8	3.56	64.1
Oct. 5.6	4.52	13.5	45.85	18.1	13.51	6.7	22.93	48.2	3.83	64.6
15.6	4.75	14.1	46.17	19.7	13.73	7.4	23.17	48.5	4.08	65.0
25.6	4.96	14.7	46.45	21.4	13.92	8.3	23.38	48.6	4.30	65.3
Nov. 4.6	5.15	15.1	46.70	23.2	14.09	9.5	23.57	48.7	4.51	65.5
14.5	5.30	15.5	46.90	25.1	14.23	10.8	23.74	48.6	4.68	65.6
24.5	5.42	15.8	47.06	26.9	14.34	12.3	23.87	48.4	4.83	65.6
Dec. 4.5	5.51	16.0	47.17	28.6	14.41	13.8	23.96	48.2	4.94	65.6
14.4	5.55	16.1	47.22	30.3	14.45	15.4	24.02	48.0	5.01	65.5
24.4	5.56	16.2	47.22	31.9	14.45	16.8	24.04	47.7	5.04	65.5
34.4	5.53	16.3	47.16	33.2	14.42	18.2	24.02	47.4	5.03	65.4

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\delta$ Mensæ.		$m$ Persei.		$\alpha$ Tauri. (Aldebaran.)		$\tau$ Tauri.		$\alpha$ Camelopardalis.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 4 24	° ' " -80 26	h m 4 26	° ' " +42 51	h m 4 30	° ' " +16 18	h m 4 36	° ' " +22 46	h m 4 44	° ' " +66 10
Jan. 0.4	32.33 <sup>0.98</sup>	40.6 <sup>2.4</sup>	41.37 <sup>0.06</sup>	30.7 <sup>1.1</sup>	25.99 <sup>0.03</sup>	52.6 <sup>0.3</sup>	30.36 <sup>0.03</sup>	16.7 <sup>0.1</sup>	33.72 <sup>0.12</sup>	47.5 <sup>2.2</sup>
10.4	31.35 <sup>1.14</sup>	43.0 <sup>2.0</sup>	41.31 <sup>0.11</sup>	31.8 <sup>0.9</sup>	25.96 <sup>0.07</sup>	52.3 <sup>0.3</sup>	30.33 <sup>0.07</sup>	16.8 <sup>0.0</sup>	33.60 <sup>0.22</sup>	49.7 <sup>2.0</sup>
20.4	30.21 <sup>1.28</sup>	45.0 <sup>1.4</sup>	41.20 <sup>0.16</sup>	32.7 <sup>0.6</sup>	25.89 <sup>0.11</sup>	52.0 <sup>0.2</sup>	30.26 <sup>0.11</sup>	16.8 <sup>0.0</sup>	33.38 <sup>0.31</sup>	51.7 <sup>1.6</sup>
30.3	28.93 <sup>1.39</sup>	46.4 <sup>0.9</sup>	41.04 <sup>0.20</sup>	33.3 <sup>0.4</sup>	25.78 <sup>0.14</sup>	51.8 <sup>0.3</sup>	30.15 <sup>0.14</sup>	16.8 <sup>0.1</sup>	33.07 <sup>0.39</sup>	53.3 <sup>1.2</sup>
Feb. 9.3	27.54 <sup>1.45</sup>	47.3 <sup>0.3</sup>	40.84 <sup>0.22</sup>	33.7 <sup>0.2</sup>	25.64 <sup>0.17</sup>	51.5 <sup>0.3</sup>	30.01 <sup>0.17</sup>	16.7 <sup>0.1</sup>	32.68 <sup>0.44</sup>	54.5 <sup>0.8</sup>
19.3	26.09 <sup>1.47</sup>	47.6 <sup>0.2</sup>	40.62 <sup>0.25</sup>	33.9 <sup>0.2</sup>	25.47 <sup>0.18</sup>	51.2 <sup>0.3</sup>	29.84 <sup>0.19</sup>	16.6 <sup>0.3</sup>	32.24 <sup>0.48</sup>	55.3 <sup>0.3</sup>
29.3	24.62 <sup>1.45</sup>	47.4 <sup>0.8</sup>	40.37 <sup>0.25</sup>	33.7 <sup>0.4</sup>	25.29 <sup>0.19</sup>	50.9 <sup>0.3</sup>	29.65 <sup>0.20</sup>	16.3 <sup>0.3</sup>	31.76 <sup>0.48</sup>	55.6 <sup>0.3</sup>
Mar. 10.2	23.17 <sup>1.40</sup>	46.6 <sup>1.3</sup>	40.12 <sup>0.24</sup>	33.3 <sup>0.7</sup>	25.10 <sup>0.18</sup>	50.6 <sup>0.2</sup>	29.45 <sup>0.19</sup>	16.0 <sup>0.3</sup>	31.28 <sup>0.48</sup>	55.3 <sup>0.7</sup>
20.2	21.77 <sup>1.31</sup>	45.3 <sup>1.7</sup>	39.88 <sup>0.22</sup>	32.6 <sup>1.0</sup>	24.92 <sup>0.16</sup>	50.4 <sup>0.3</sup>	29.26 <sup>0.17</sup>	15.7 <sup>0.4</sup>	30.80 <sup>0.44</sup>	54.6 <sup>1.1</sup>
30.2	20.46 <sup>1.19</sup>	43.6 <sup>2.2</sup>	39.66 <sup>0.18</sup>	31.6 <sup>1.1</sup>	24.76 <sup>0.14</sup>	50.1 <sup>0.2</sup>	29.09 <sup>0.15</sup>	15.3 <sup>0.4</sup>	30.36 <sup>0.38</sup>	53.5 <sup>1.6</sup>
Apr. 9.1	19.27 <sup>1.05</sup>	41.4 <sup>2.6</sup>	39.48 <sup>0.13</sup>	30.5 <sup>1.2</sup>	24.62 <sup>0.10</sup>	49.9 <sup>0.1</sup>	28.94 <sup>0.11</sup>	14.9 <sup>0.4</sup>	29.98 <sup>0.31</sup>	51.9 <sup>1.8</sup>
19.1	18.22 <sup>0.87</sup>	38.8 <sup>2.9</sup>	39.35 <sup>0.09</sup>	29.3 <sup>1.3</sup>	24.52 <sup>0.07</sup>	49.8 <sup>0.0</sup>	28.83 <sup>0.07</sup>	14.5 <sup>0.3</sup>	29.67 <sup>0.22</sup>	50.1 <sup>2.1</sup>
29.1	17.35 <sup>0.68</sup>	35.9 <sup>3.2</sup>	39.26 <sup>0.02</sup>	28.0 <sup>1.3</sup>	24.45 <sup>0.02</sup>	49.8 <sup>0.1</sup>	28.76 <sup>0.03</sup>	14.2 <sup>0.3</sup>	29.45 <sup>0.12</sup>	48.0 <sup>2.3</sup>
May 9.1	16.67 <sup>0.47</sup>	32.7 <sup>3.3</sup>	39.24 <sup>0.03</sup>	26.7 <sup>1.3</sup>	24.43 <sup>0.03</sup>	49.9 <sup>0.2</sup>	28.73 <sup>0.03</sup>	13.9 <sup>0.1</sup>	29.33 <sup>0.02</sup>	45.7 <sup>2.3</sup>
19.0	16.20 <sup>0.26</sup>	29.4 <sup>3.4</sup>	39.27 <sup>0.10</sup>	25.4 <sup>1.2</sup>	24.46 <sup>0.07</sup>	50.1 <sup>0.4</sup>	28.76 <sup>0.07</sup>	13.8 <sup>0.0</sup>	29.31 <sup>0.08</sup>	43.4 <sup>2.3</sup>
29.0	15.94 <sup>0.03</sup>	26.0 <sup>3.5</sup>	39.37 <sup>0.15</sup>	24.2 <sup>1.0</sup>	24.53 <sup>0.12</sup>	50.5 <sup>0.5</sup>	28.83 <sup>0.12</sup>	13.8 <sup>0.1</sup>	29.39 <sup>0.19</sup>	41.1 <sup>2.3</sup>
June 8.0	15.91 <sup>0.19</sup>	22.5 <sup>3.4</sup>	39.52 <sup>0.21</sup>	23.2 <sup>0.9</sup>	24.65 <sup>0.16</sup>	51.0 <sup>0.6</sup>	28.95 <sup>0.16</sup>	13.9 <sup>0.2</sup>	29.58 <sup>0.28</sup>	38.8 <sup>2.1</sup>
18.0	16.10 <sup>0.42</sup>	19.1 <sup>3.3</sup>	39.73 <sup>0.25</sup>	22.3 <sup>0.6</sup>	24.81 <sup>0.20</sup>	51.6 <sup>0.7</sup>	29.11 <sup>0.20</sup>	14.1 <sup>0.4</sup>	29.86 <sup>0.37</sup>	36.7 <sup>1.9</sup>
27.9	16.52 <sup>0.62</sup>	15.8 <sup>3.0</sup>	39.98 <sup>0.30</sup>	21.7 <sup>0.4</sup>	25.01 <sup>0.23</sup>	52.3 <sup>0.9</sup>	29.31 <sup>0.23</sup>	14.5 <sup>0.5</sup>	30.23 <sup>0.45</sup>	34.8 <sup>1.6</sup>
July 7.9	17.14 <sup>0.81</sup>	12.8 <sup>2.7</sup>	40.28 <sup>0.33</sup>	21.3 <sup>0.3</sup>	25.24 <sup>0.26</sup>	53.2 <sup>0.9</sup>	29.54 <sup>0.27</sup>	15.0 <sup>0.6</sup>	30.68 <sup>0.51</sup>	33.2 <sup>1.3</sup>
17.9	17.95 <sup>0.97</sup>	10.1 <sup>2.4</sup>	40.61 <sup>0.35</sup>	21.0 <sup>0.0</sup>	25.50 <sup>0.27</sup>	54.1 <sup>1.0</sup>	29.81 <sup>0.28</sup>	15.6 <sup>0.7</sup>	31.19 <sup>0.57</sup>	31.9 <sup>1.1</sup>
27.9	18.92 <sup>1.11</sup>	7.7 <sup>1.8</sup>	40.96 <sup>0.37</sup>	21.0 <sup>0.3</sup>	25.77 <sup>0.29</sup>	55.1 <sup>1.0</sup>	30.09 <sup>0.30</sup>	16.3 <sup>0.7</sup>	31.76 <sup>0.61</sup>	30.8 <sup>0.6</sup>
Aug. 6.8	20.03 <sup>1.22</sup>	5.9 <sup>1.3</sup>	41.33 <sup>0.38</sup>	21.3 <sup>0.4</sup>	26.06 <sup>0.30</sup>	56.1 <sup>0.9</sup>	30.39 <sup>0.30</sup>	17.0 <sup>0.8</sup>	32.37 <sup>0.64</sup>	30.2 <sup>0.3</sup>
16.8	21.25 <sup>1.29</sup>	4.6 <sup>0.8</sup>	41.71 <sup>0.38</sup>	21.7 <sup>0.6</sup>	26.36 <sup>0.30</sup>	57.0 <sup>0.9</sup>	30.69 <sup>0.31</sup>	17.8 <sup>0.8</sup>	33.01 <sup>0.65</sup>	29.9 <sup>0.0</sup>
26.8	22.54 <sup>1.31</sup>	3.8 <sup>0.1</sup>	42.09 <sup>0.38</sup>	22.3 <sup>0.8</sup>	26.66 <sup>0.29</sup>	57.9 <sup>0.8</sup>	31.00 <sup>0.31</sup>	18.6 <sup>0.7</sup>	33.66 <sup>0.66</sup>	29.9 <sup>0.4</sup>
Sept. 5.7	23.85 <sup>1.29</sup>	3.7 <sup>0.5</sup>	42.47 <sup>0.37</sup>	23.1 <sup>0.9</sup>	26.95 <sup>0.29</sup>	58.7 <sup>0.6</sup>	31.31 <sup>0.31</sup>	19.3 <sup>0.7</sup>	34.32 <sup>0.66</sup>	30.3 <sup>0.7</sup>
15.7	25.14 <sup>1.24</sup>	4.2 <sup>1.2</sup>	42.84 <sup>0.36</sup>	24.0 <sup>1.1</sup>	27.24 <sup>0.28</sup>	59.3 <sup>0.6</sup>	31.62 <sup>0.29</sup>	20.0 <sup>0.7</sup>	34.98 <sup>0.64</sup>	31.0 <sup>1.1</sup>
25.7	26.38 <sup>1.13</sup>	5.4 <sup>1.7</sup>	43.20 <sup>0.34</sup>	25.1 <sup>1.2</sup>	27.52 <sup>0.26</sup>	59.9 <sup>0.4</sup>	31.91 <sup>0.28</sup>	20.7 <sup>0.5</sup>	35.62 <sup>0.61</sup>	32.1 <sup>1.4</sup>
Oct. 5.7	27.51 <sup>0.98</sup>	7.1 <sup>2.2</sup>	43.54 <sup>0.32</sup>	26.2 <sup>1.3</sup>	27.78 <sup>0.25</sup>	60.3 <sup>0.2</sup>	32.19 <sup>0.26</sup>	21.2 <sup>0.5</sup>	36.23 <sup>0.58</sup>	33.5 <sup>1.7</sup>
15.6	28.49 <sup>0.80</sup>	9.3 <sup>2.7</sup>	43.86 <sup>0.30</sup>	27.5 <sup>1.3</sup>	28.03 <sup>0.23</sup>	60.5 <sup>0.1</sup>	32.45 <sup>0.25</sup>	21.7 <sup>0.4</sup>	36.81 <sup>0.53</sup>	35.2 <sup>2.0</sup>
25.6	29.29 <sup>0.60</sup>	12.0 <sup>3.0</sup>	44.16 <sup>0.26</sup>	28.8 <sup>1.4</sup>	28.26 <sup>0.21</sup>	60.6 <sup>0.0</sup>	32.70 <sup>0.22</sup>	22.1 <sup>0.3</sup>	37.34 <sup>0.47</sup>	37.2 <sup>2.2</sup>
Nov. 4.6	29.89 <sup>0.36</sup>	15.0 <sup>3.3</sup>	44.42 <sup>0.22</sup>	30.2 <sup>1.5</sup>	28.47 <sup>0.18</sup>	60.6 <sup>0.1</sup>	32.92 <sup>0.19</sup>	22.4 <sup>0.2</sup>	37.81 <sup>0.41</sup>	39.4 <sup>2.4</sup>
14.5	30.25 <sup>0.12</sup>	18.3 <sup>3.3</sup>	44.64 <sup>0.19</sup>	31.7 <sup>1.4</sup>	28.65 <sup>0.15</sup>	60.5 <sup>0.1</sup>	33.11 <sup>0.16</sup>	22.6 <sup>0.3</sup>	38.22 <sup>0.33</sup>	41.8 <sup>2.5</sup>
24.5	30.37 <sup>0.14</sup>	21.6 <sup>3.4</sup>	44.83 <sup>0.14</sup>	33.1 <sup>1.5</sup>	28.80 <sup>0.11</sup>	60.4 <sup>0.2</sup>	33.27 <sup>0.13</sup>	22.9 <sup>0.2</sup>	38.55 <sup>0.24</sup>	44.3 <sup>2.6</sup>
Dec. 4.5	30.23 <sup>0.39</sup>	25.0 <sup>3.2</sup>	44.97 <sup>0.08</sup>	34.6 <sup>1.4</sup>	28.91 <sup>0.08</sup>	60.2 <sup>0.2</sup>	33.40 <sup>0.09</sup>	23.1 <sup>0.1</sup>	38.79 <sup>0.15</sup>	46.9 <sup>2.6</sup>
14.5	29.84 <sup>0.63</sup>	28.2 <sup>3.0</sup>	45.05 <sup>0.03</sup>	36.0 <sup>1.3</sup>	28.99 <sup>0.04</sup>	60.0 <sup>0.3</sup>	33.49 <sup>0.04</sup>	23.2 <sup>0.2</sup>	38.94 <sup>0.04</sup>	49.5 <sup>2.6</sup>
24.4	29.21 <sup>0.85</sup>	31.2 <sup>2.7</sup>	45.08 <sup>0.02</sup>	37.3 <sup>1.2</sup>	29.03 <sup>0.01</sup>	59.7 <sup>0.2</sup>	33.53 <sup>0.00</sup>	23.4 <sup>0.1</sup>	38.98 <sup>0.06</sup>	52.1 <sup>2.1</sup>
34.4	28.36 <sup>0.85</sup>	33.9 <sup>2.7</sup>	45.06 <sup>0.02</sup>	38.5 <sup>1.2</sup>	29.02 <sup>0.01</sup>	59.5 <sup>0.2</sup>	33.53 <sup>0.00</sup>	23.5 <sup>0.1</sup>	38.92 <sup>0.06</sup>	54.5 <sup>2.1</sup>

# FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

339

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	♌ Tauri.			♉ Aurigæ.			ζ Aurigæ.			♈ Orionis.			β Eridani.		
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion South.	
	h m 4 45	° +18 40		h m 4 50	° +33 0		h m 4 55	° +40 55		h m 4 59	° +15 16		h m 5 3	° -5 12	
	s	"		s	"		s	"		s	"		s	"	
Jan. 0.4	46.83	29.0	46.07	46.5	47.82	65.3	6.36	6.2	9.11	48.2					
10.4	46.81 .02	28.9 .01	46.05 .02	47.2 .07	47.80 .02	66.4 1.1	6.35 .01	5.9 .03	9.09 .02	49.6 1.4					
20.4	46.74 .07	28.8 .01	45.98 .07	47.7 .05	47.72 .08	67.4 1.0	6.30 .05	5.6 .03	9.03 .06	50.8 1.2					
30.4	46.64 .10	28.6 .02	45.87 .11	48.2 .05	47.59 .13	68.2 .8	6.21 .09	5.3 .03	8.94 .09	51.9 1.1					
Feb. 9.3	46.50 .14	28.4 .02	45.71 .16	48.5 .03	47.42 .17	68.7 .5	6.08 .13	5.1 .02	8.81 .13	52.8 .9					
	46.50 .16	28.4 .02	45.71 .19	48.5 .01	47.42 .21	68.7 .3	6.08 .16	5.1 .03	8.81 .16	52.8 .6					
19.3	46.34 .18	28.2 .02	45.52 .20	48.6 .01	47.21 .23	69.0 .1	5.92 .18	4.8 .02	8.65 .18	53.4 .4					
29.3	46.16 .19	28.0 .02	45.32 .22	48.5 .01	46.98 .25	69.1 .1	5.74 .19	4.6 .02	8.47 .19	53.8 .2					
Mar. 10.2	45.97 .19	27.8 .03	45.10 .21	48.3 .02	46.73 .25	69.0 .1	5.55 .18	4.4 .01	8.28 .18	54.0 .1					
20.2	45.78 .17	27.5 .02	44.89 .20	47.9 .06	46.49 .22	68.5 .6	5.37 .18	4.3 .02	8.10 .18	53.9 .2					
30.2	45.61 .15	27.3 .03	44.69 .17	47.3 .06	46.27 .20	67.9 .9	5.19 .15	4.1 .01	7.92 .16	53.7 .5					
Apr. 9.2	45.46 .12	27.0 .02	44.52 .14	46.7 .08	46.07 .16	67.0 1.0	5.04 .12	4.0 .00	7.76 .13	53.2 .7					
19.1	45.34 .07	26.8 .01	44.38 .09	45.9 .07	45.91 .11	66.0 1.1	4.92 .09	4.0 .00	7.63 .09	52.5 1.0					
29.1	45.27 .04	26.7 .00	44.29 .04	45.2 .08	45.80 .05	64.9 1.1	4.83 .05	4.0 .02	7.54 .06	51.5 1.1					
May 9.1	45.23 .02	26.7 .01	44.25 .01	44.4 .07	45.75 .00	63.8 1.2	4.78 .00	4.2 .02	7.48 .01	50.4 1.3					
19.1	45.25 .06	26.8 .02	44.26 .06	43.7 .07	45.75 .06	62.6 1.1	4.78 .05	4.4 .04	7.47 .03	49.1 1.5					
29.1	45.31 .11	27.0 .03	44.32 .11	43.0 .05	45.81 .11	61.5 1.0	4.83 .09	4.8 .05	7.50 .07	47.6 1.6					
June 8.0	45.42 .15	27.3 .04	44.43 .16	42.5 .04	45.92 .17	60.5 .9	4.92 .14	5.3 .06	7.57 .11	46.0 1.8					
18.0	45.57 .18	27.7 .06	44.59 .21	42.1 .03	46.09 .22	59.6 .7	5.06 .17	5.9 .07	7.68 .15	44.2 1.8					
27.9	45.75 .22	28.3 .07	44.80 .24	41.8 .01	46.31 .26	58.9 .5	5.23 .21	6.6 .08	7.83 .19	42.4 1.8					
July 7.9	45.97 .25	29.0 .07	45.04 .28	41.7 .00	46.57 .30	58.4 .4	5.44 .23	7.4 .08	8.02 .21	40.6 1.7					
17.9	46.22 .27	29.7 .08	45.32 .30	41.7 .02	46.87 .32	58.0 .2	5.67 .26	8.2 .09	8.23 .24	38.9 1.7					
27.9	46.49 .29	30.5 .08	45.62 .32	41.9 .03	47.19 .35	57.8 .0	5.93 .27	9.1 .09	8.47 .26	37.2 1.5					
Aug. 6.8	46.78 .30	31.3 .08	45.94 .33	42.2 .05	47.54 .36	57.8 .2	6.20 .29	10.0 .08	8.73 .27	35.7 1.3					
16.8	47.08 .30	32.1 .08	46.27 .33	42.7 .05	47.90 .37	58.0 .3	6.49 .29	10.8 .07	9.00 .27	34.4 1.0					
26.8	47.38 .30	32.9 .07	46.60 .34	43.2 .06	48.27 .37	58.3 .5	6.78 .30	11.5 .07	9.27 .28	33.4 .8					
Sept. 5.8	47.68 .29	33.6 .06	46.94 .33	43.8 .06	48.64 .37	58.8 .6	7.08 .29	12.2 .05	9.55 .28	32.6 .4					
15.7	47.97 .29	34.2 .05	47.27 .33	44.4 .06	49.01 .36	59.4 .7	7.37 .28	12.7 .03	9.83 .27	32.2 .1					
25.7	48.26 .28	34.7 .04	47.60 .32	45.0 .07	49.37 .35	60.1 .8	7.65 .28	13.0 .3	10.10 .26	32.1 .3					
Oct. 5.7	48.54 .26	35.1 .02	47.92 .30	45.7 .07	49.72 .33	60.9 .9	7.93 .26	13.3 .00	10.36 .26	32.4 .5					
15.6	48.80 .25	35.3 .02	48.22 .28	46.4 .08	50.05 .32	61.8 1.0	8.19 .25	13.3 .00	10.62 .23	32.9 .9					
25.6	49.05 .22	35.5 .00	48.50 .25	47.2 .07	50.37 .28	62.8 1.1	8.44 .23	13.3 .02	10.85 .22	33.8 1.2					
Nov. 4.6	49.27 .20	35.5 .00	48.75 .23	47.9 .08	50.65 .26	63.9 1.1	8.67 .21	13.1 .03	11.07 .19	35.0 1.3					
14.6	49.47 .16	35.5 .00	48.98 .19	48.7 .07	50.91 .21	65.0 1.2	8.88 .17	12.8 .03	11.26 .16	36.3 1.5					
24.5	49.63 .13	35.5 .01	49.17 .15	49.4 .08	51.12 .18	66.2 1.3	9.05 .15	12.5 .03	11.42 .13	37.8 1.6					
Dec. 4.5	49.76 .10	35.4 .01	49.32 .11	50.2 .08	51.30 .12	67.5 1.2	9.20 .10	12.2 .04	11.55 .10	39.4 1.6					
14.5	49.86 .05	35.3 .02	49.43 .07	51.0 .08	51.42 .07	68.7 1.2	9.30 .06	11.8 .03	11.65 .05	41.0 1.6					
24.5	49.91 .01	35.1 .01	49.50 .01	51.8 .07	51.49 .02	69.9 1.2	9.36 .02	11.5 .03	11.70 .01	42.6 1.4					
34.4	49.92 .01	35.0 .01	49.51 .01	52.5 .01	51.51 .01	71.1 .01	9.38 .01	11.2 .01	11.71 .01	44.0 .01					

# FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Aurigæ. ( <i>Capella</i> .)		$\beta$ Orionis. ( <i>Rigel</i> .)		$\tau$ Orionis.		$\beta$ Tauri.		$\chi$ Aurigæ.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 5 9	° ' " +45 53	h m 5 9	° ' " - 8 18	h m 5 12	° ' " - 6 56	h m 5 20	° ' " +28 31	h m 5 26	° ' " +32 7
	s	"	s	"	s	"	s	"	s	"
Jan. 0.4	37.79	.01 57.8	.02 56.74	.02 55.9	.01 58.01	.01 63.9	.01 14.95	.01 28.6	.02 30.39	.02 9.4
10.4	37.78	.07 59.1	.05 56.72	.05 57.5	.05 58.00	.05 65.4	.04 14.96	.04 29.0	.03 30.41	.03 10.0
20.4	37.71	.13 60.4	.10 56.67	.10 58.8	.09 57.95	.08 66.8	.08 14.92	.08 29.4	.09 30.38	.09 10.6
30.4	37.58	.18 61.4	.13 56.57	.13 60.0	.13 57.86	.12 68.0	.13 14.84	.13 29.7	.13 30.29	.13 11.1
Feb. 9.3	37.40	.22 62.3	.16 56.44	.16 61.0	.16 57.73	.16 68.9	.16 14.71	.16 30.0	.17 30.16	.17 11.6
19.3	37.18	.25 62.8	.18 56.28	.18 61.7	.17 57.57	.17 69.6	.19 14.55	.19 30.2	.20 29.99	.20 11.9
29.3	36.93	.27 63.1	.19 56.10	.19 62.2	.19 57.40	.19 70.0	.21 14.36	.21 30.3	.21 29.79	.21 12.1
Mar. 10.3	36.66	.27 63.0	.19 55.91	.19 62.4	.19 57.21	.19 70.2	.21 14.15	.21 30.2	.21 29.58	.21 12.1
20.2	36.39	.25 62.7	.18 55.72	.18 62.3	.18 57.02	.18 70.2	.20 13.94	.20 30.0	.21 29.37	.21 11.9
30.2	36.14	.23 62.1	.16 55.54	.16 62.0	.17 56.84	.17 69.9	.18 13.74	.18 29.7	.19 29.16	.19 11.6
Apr. 9.2	35.91	.18 61.2	.14 55.38	.14 61.5	.13 56.67	.13 69.4	.15 13.56	.15 29.3	.16 28.97	.16 11.2
19.1	35.73	.14 60.1	.10 55.24	.10 60.7	.11 56.54	.11 68.7	.11 13.41	.11 28.9	.12 28.81	.12 10.7
29.1	35.59	.08 58.9	.06 55.14	.06 59.6	.06 56.43	.06 67.7	.06 13.30	.06 28.4	.08 28.69	.08 10.1
May 9.1	35.51	.01 57.5	.03 55.08	.03 58.4	.02 56.37	.02 66.5	.02 13.24	.02 27.9	.02 28.61	.02 9.4
19.1	35.50	.04 56.1	.03 55.05	.03 56.9	.02 56.35	.02 65.1	.03 13.22	.03 27.4	.02 28.59	.02 8.8
29.0	35.54	.10 54.7	.06 55.08	.06 55.3	.06 56.37	.06 63.6	.08 13.25	.08 27.0	.08 28.61	.08 8.2
June 8.0	35.64	.16 53.4	.11 55.14	.11 53.5	.10 56.43	.10 61.9	.13 13.33	.13 26.7	.12 28.69	.12 7.6
18.0	35.80	.22 52.2	.14 55.25	.14 51.6	.14 56.53	.14 60.1	.17 13.46	.17 26.4	.17 28.81	.17 7.1
28.0	36.02	.26 51.1	.18 55.39	.18 49.7	.18 56.67	.18 58.2	.20 13.63	.20 26.3	.21 28.98	.21 6.7
July 7.9	36.28	.31 50.2	.21 55.57	.21 47.8	.21 56.85	.21 56.4	.24 13.83	.24 26.2	.24 29.19	.24 6.5
17.9	36.59	.33 49.5	.23 55.78	.23 45.9	.23 57.06	.23 54.6	.27 14.07	.27 26.3	.27 29.43	.27 6.3
27.9	36.92	.36 49.0	.25 56.01	.25 44.1	.25 57.29	.25 52.8	.29 14.34	.29 26.5	.29 29.70	.29 6.3
Aug. 6.8	37.28	.39 48.6	.27 56.26	.27 42.5	.26 57.54	.26 51.3	.30 14.63	.30 26.7	.32 29.99	.32 6.3
16.8	37.67	.39 48.5	.27 56.53	.27 41.2	.26 57.80	.26 50.0	.32 14.93	.32 27.0	.32 30.31	.32 6.5
26.8	38.06	.40 48.6	.28 56.80	.28 40.1	.28 58.07	.28 48.9	.32 15.25	.32 27.3	.33 30.63	.33 6.7
Sept. 5.8	38.46	.40 48.8	.28 57.08	.28 39.3	.28 58.35	.28 48.1	.32 15.57	.32 27.7	.33 30.96	.33 6.9
15.7	38.86	.40 49.2	.27 57.36	.27 38.9	.28 58.63	.28 47.7	.32 15.89	.32 28.0	.34 31.29	.34 7.2
25.7	39.26	.38 49.8	.27 57.63	.27 38.8	.27 58.91	.27 47.6	.31 16.21	.31 28.4	.32 31.63	.32 7.5
Oct. 5.7	39.64	.37 50.6	.26 57.90	.26 39.1	.25 59.18	.25 47.9	.31 16.52	.31 28.7	.32 31.95	.32 7.9
15.7	40.01	.35 51.5	.24 58.16	.24 39.8	.24 59.43	.24 48.6	.29 16.83	.29 29.1	.30 32.27	.30 8.3
25.6	40.36	.33 52.5	.22 58.40	.22 40.8	.23 59.67	.23 49.5	.27 17.12	.27 29.4	.29 32.57	.29 8.7
Nov. 4.6	40.69	.29 53.6	.19 58.62	.19 42.1	.20 59.90	.20 50.7	.24 17.39	.24 29.7	.26 32.86	.26 9.1
14.6	40.98	.25 54.9	.17 58.81	.17 43.6	.17 60.10	.17 52.2	.22 17.63	.22 30.1	.23 33.12	.23 9.6
24.5	41.23	.20 56.3	.13 58.98	.13 45.3	.14 60.27	.14 53.8	.18 17.85	.18 30.4	.19 33.35	.19 10.1
Dec. 4.5	41.43	.15 57.7	.10 59.11	.10 47.0	.10 60.41	.10 55.5	.14 18.03	.14 30.8	.15 33.54	.15 10.7
14.5	41.58	.09 59.2	.06 59.21	.06 48.8	.06 60.51	.06 57.2	.09 18.17	.09 31.2	.11 33.69	.11 11.3
24.5	41.67	.03 60.7	.01 59.27	.01 50.6	.02 60.57	.02 58.9	.04 18.26	.04 31.6	.05 33.80	.05 11.9
34.4	41.70	.02 62.2	.01 59.28	.01 52.2	.02 60.59	.02 60.5	.04 18.30	.04 32.1	.05 33.85	.05 12.6



# FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

341

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	Groombridge 966.		δ Orionis.		α Leporis.		Groombridge 944.		ε Orionis.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.
	h m 5 26	° ' " +74 58	h m 5 27	° ' " - 0 22	h m 5 28	° ' " -17 53	h m 5 31	° ' " +85 8	h m 5 31	° ' " - 1 15
	s	"	s	"	s	"	s	"	s	"
Jan. 0.5	58.50 0.09	47.3 2.8	7.46 .01	22.6 1.2	31.15 .01	39.4 2.1	25.93 0.42	55.6 3.1	21.87 .01	57.5 1.3
10.4	58.41 0.25	50.1 2.6	7.47 .04	23.8 1.1	31.14 .05	41.5 1.8	25.51 0.92	58.7 2.9	21.88 .03	58.8 1.1
20.4	58.16 0.41	52.7 2.3	7.43 .07	24.9 1.0	31.09 .09	43.3 1.6	24.59 1.38	61.6 2.6	21.85 .07	59.9 1.0
30.4	57.75 0.55	55.0 1.9	7.36 .12	25.9 0.7	31.00 .14	44.9 1.3	23.21 1.78	64.2 2.2	21.78 .11	60.9 0.8
Feb. 9.3	57.20 0.65	56.9 1.4	7.24 .15	26.6 0.6	30.86 .16	46.2 1.0	21.43 2.11	66.4 1.6	21.67 .15	61.7 0.6
19.3	56.55 0.73	58.3 0.9	7.09 .17	27.2 0.4	30.70 .19	47.2 0.7	19.32 2.34	68.0 1.1	21.52 .17	62.3 0.5
29.3	55.82 0.78	59.2 0.4	6.92 .18	27.6 0.3	30.51 .20	47.9 0.3	16.98 2.47	69.1 0.6	21.35 .18	62.8 0.2
Mar. 10.3	55.04 0.78	59.6 0.2	6.74 .19	27.9 0.0	30.31 .21	48.2 0.0	14.51 2.50	69.7 0.1	21.17 .19	63.0 0.0
20.2	54.26 0.76	59.4 0.7	6.55 .18	27.9 0.1	30.10 .20	48.2 0.4	12.01 2.42	69.6 0.7	20.98 .18	63.0 0.1
30.2	53.50 0.70	58.7 1.2	6.37 .16	27.8 0.4	29.90 .18	47.8 0.7	9.59 2.25	68.9 1.3	20.80 .17	62.9 0.3
Apr. 9.2	52.80 0.60	57.5 1.6	6.21 .14	27.4 0.5	29.72 .16	47.1 1.0	7.34 1.99	67.6 1.7	20.63 .14	62.6 0.6
19.2	52.20 0.49	55.9 2.0	6.07 .11	26.9 0.7	29.56 .13	46.1 1.3	5.35 1.66	65.9 2.2	20.49 .11	62.0 0.7
29.1	51.71 0.36	53.9 2.3	5.96 .07	26.2 0.8	29.43 .09	44.8 1.5	3.69 1.27	63.7 2.5	20.38 .08	61.3 0.9
May 9.1	51.35 0.21	51.6 2.5	5.89 .03	25.4 1.1	29.34 .04	43.3 1.8	2.42 0.84	61.2 2.7	20.30 .03	60.4 1.0
19.1	51.14 0.05	49.1 2.6	5.86 .01	24.3 1.1	29.30 .01	41.5 2.0	1.58 0.38	58.5 2.9	20.27 .01	59.4 1.2
29.0	51.09 0.10	46.5 2.7	5.87 .05	23.2 1.3	29.29 .04	39.5 2.2	1.20 0.09	55.6 3.0	20.28 .05	58.2 1.4
June 8.0	51.19 0.25	43.8 2.6	5.92 .10	21.9 1.4	29.33 .08	37.3 2.3	1.29 0.54	52.6 3.0	20.33 .09	56.8 1.4
18.0	51.44 0.39	41.2 2.5	6.02 .13	20.5 1.5	29.41 .12	35.0 2.3	1.83 0.99	49.6 2.8	20.42 .13	55.4 1.5
28.0	51.83 0.53	38.7 2.3	6.15 .17	19.0 1.5	29.53 .16	32.7 2.3	2.82 1.39	46.8 2.7	20.55 .16	53.9 1.6
July 7.9	52.36 0.65	36.4 2.1	6.32 .20	17.5 1.5	29.69 .19	30.4 2.3	4.21 1.78	44.1 2.4	20.71 .20	52.3 1.5
17.9	53.01 0.75	34.3 1.8	6.52 .23	16.0 1.5	29.88 .22	28.1 2.1	5.99 2.10	41.7 2.1	20.91 .22	50.8 1.5
27.9	53.76 0.84	32.5 1.4	6.75 .24	14.5 1.3	30.10 .24	26.0 1.9	8.09 2.39	39.6 1.8	21.13 .24	49.3 1.3
Aug. 6.9	54.60 0.91	31.1 1.1	6.99 .26	13.2 1.1	30.34 .26	24.1 1.6	10.48 2.63	37.8 1.3	21.37 .25	48.0 1.2
16.8	55.51 0.96	30.0 0.7	7.25 .27	12.1 1.0	30.60 .27	22.5 1.3	13.11 2.81	36.5 1.0	21.62 .27	46.8 0.9
26.8	56.47 0.99	29.3 0.4	7.52 .28	11.1 0.7	30.87 .28	21.2 0.8	15.92 2.94	35.5 0.5	21.89 .28	45.9 0.7
Sept. 5.8	57.46 1.02	28.9 0.1	7.80 .28	10.4 0.4	31.15 .29	20.4 0.5	18.86 3.00	35.0 0.1	22.17 .28	45.2 0.4
15.7	58.48 1.01	29.0 0.5	8.08 .28	10.0 0.1	31.44 .28	19.9 0.0	21.86 3.01	34.9 0.4	22.45 .28	44.8 0.1
25.7	59.49 0.99	29.5 0.8	8.36 .27	9.9 0.2	31.72 .28	19.9 0.4	24.87 2.97	35.3 0.9	22.73 .27	44.7 0.2
Oct. 5.7	60.48 0.96	30.3 1.3	8.63 .26	10.1 0.5	32.00 .27	20.3 0.9	27.84 2.86	36.2 1.3	23.00 .26	44.9 0.5
15.7	61.44 0.90	31.6 1.6	8.89 .25	10.6 0.7	32.27 .25	21.2 1.3	30.70 2.68	37.5 1.7	23.26 .26	45.4 0.7
25.6	62.34 0.83	33.2 1.9	9.14 .24	11.3 1.0	32.52 .24	22.5 1.7	33.38 2.44	39.2 2.1	23.52 .24	46.1 1.1
Nov. 4.6	63.17 0.73	35.1 2.3	9.38 .21	12.3 1.1	32.76 .21	24.2 1.9	35.82 2.14	41.3 2.5	23.76 .21	47.2 1.2
14.6	63.90 0.62	37.4 2.6	9.59 .19	13.4 1.3	32.97 .18	26.1 2.1	37.96 1.79	43.8 2.8	23.97 .19	48.4 1.3
24.6	64.52 0.49	40.0 2.7	9.78 .16	14.7 1.4	33.15 .15	28.2 2.3	39.75 1.36	46.6 3.1	24.16 .16	49.7 1.5
Dec. 4.5	65.01 0.34	42.7 2.9	9.94 .12	16.1 1.4	33.30 .10	30.5 2.3	41.11 0.90	49.7 3.2	24.32 .12	51.2 1.4
14.5	65.35 0.18	45.6 3.0	10.06 .08	17.5 1.3	33.40 .07	32.8 2.3	42.01 0.41	52.9 3.3	24.44 .09	52.6 1.4
24.5	65.53 0.01	48.6 2.8	10.14 .03	18.8 1.3	33.47 .02	35.1 2.2	42.42 0.10	56.2 3.2	24.53 .04	54.0 1.4
34.4	65.54	51.4	10.17	20.1	33.49	37.3	42.32	59.4	24.57	55.4

## FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Columbæ.		$\kappa$ Orionis.		$\delta$ Doradus.		$\nu$ Aurigæ.		$\alpha$ Orionis.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m	° '	h m	° '	h m	° '	h m	° '	h m	° '
	5 36	-34 7	5 43	-9 42	5 44	-65 46	5 44	+39 7	5 49	+7 23
Jan. 0.5	11.95	.03	13.59	.02	39.13	.18	51.98	.04	59.87	.03
10.4	11.92	.08	13.61	.03	38.95	.27	52.02	.02	59.90	.01
20.4	11.84	.12	13.58	.08	38.68	.36	52.00	.08	59.89	.05
30.4	11.72	.17	13.50	.11	38.32	.43	51.92	.13	59.84	.10
Feb. 9.4	11.55	.20	13.39	.15	37.89	.49	51.79	.18	59.74	.14
19.3	11.35	.23	13.24	.17	37.40	.54	51.61	.21	59.60	.16
29.3	11.12	.25	13.07	.19	36.86	.57	51.40	.23	59.44	.18
Mar. 10.3	10.87	.25	12.88	.19	36.29	.57	51.17	.23	59.26	.18
20.2	10.62	.25	12.69	.19	35.72	.56	50.94	.24	59.08	.19
30.2	10.37	.23	12.50	.18	35.16	.54	50.70	.22	58.89	.17
Apr. 9.2	10.14	.20	12.32	.16	34.62	.50	50.48	.18	58.72	.15
19.2	9.94	.17	12.16	.12	34.12	.44	50.30	.15	58.57	.12
29.1	9.77	.13	12.04	.09	33.68	.38	50.15	.10	58.45	.08
May 9.1	9.64	.08	11.95	.05	33.30	.30	50.05	.05	58.37	.04
19.1	9.56	.04	11.90	.01	33.00	.22	50.00	.00	58.33	.01
29.1	9.52	.01	11.89	.03	32.78	.13	50.00	.06	58.32	.04
June 8.0	9.53	.06	11.92	.08	32.65	.04	50.06	.11	58.36	.08
18.0	9.59	.10	12.00	.11	32.61	.06	50.17	.16	58.44	.12
28.0	9.69	.15	12.11	.15	32.67	.14	50.33	.20	58.56	.16
July 7.9	9.84	.18	12.26	.18	32.81	.23	50.53	.24	58.72	.19
17.9	10.02	.22	12.44	.21	33.04	.31	50.77	.28	58.91	.21
27.9	10.24	.25	12.65	.23	33.35	.39	51.05	.30	59.12	.23
Aug. 6.9	10.49	.28	12.88	.25	33.74	.44	51.35	.33	59.35	.26
16.8	10.77	.29	13.13	.26	34.18	.50	51.68	.35	59.61	.26
26.8	11.06	.31	13.39	.27	34.68	.54	52.03	.35	59.87	.28
Sept. 5.8	11.37	.31	13.66	.28	35.22	.55	52.38	.36	60.15	.28
15.8	11.68	.31	13.94	.28	35.77	.57	52.74	.36	60.43	.29
25.7	11.99	.31	14.22	.28	36.34	.56	53.10	.36	60.72	.28
Oct. 5.7	12.30	.30	14.50	.27	36.90	.53	53.46	.36	61.00	.28
15.7	12.60	.28	14.77	.26	37.43	.49	53.82	.34	61.28	.27
25.6	12.88	.25	15.03	.24	37.92	.44	54.16	.32	61.55	.25
Nov. 4.6	13.13	.23	15.27	.22	38.36	.37	54.48	.30	61.80	.24
14.6	13.36	.19	15.49	.20	38.73	.28	54.78	.27	62.04	.21
24.6	13.55	.15	15.69	.16	39.01	.19	55.05	.23	62.25	.19
Dec. 4.5	13.70	.10	15.85	.13	39.20	.09	55.28	.18	62.44	.14
14.5	13.80	.06	15.98	.09	39.29	.01	55.46	.13	62.58	.11
24.5	13.86	.01	16.07	.04	39.28	.11	55.59	.08	62.69	.07
34.5	13.87		16.11		39.17		55.67		62.76	

# FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

343

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\beta$ Aurigæ.			$\theta$ Aurigæ.			$\nu$ Orionis.			22 Camelop. (H.).			$\eta$ Geminorum.		
	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.
	h	m	°	h	m	°	h	m	°	h	m	°	h	m	°
	5	52	+44 56	5	53	+37 12	6	2	+14 46	6	8	+69 20	6	9	+22 31
	s		"	s		"	s		"	s		"	s		"
Jan. 0.5	31.23	.05	9.2	12.26	.05	13.8	6.92	.05	38.5	20.07	.06	67.0	6.52	.06	55.7
10.4	31.28	.02	10.5 1.3	12.31	.01	14.7 0.9	6.97	.00	38.1 0.4	20.13	.06	69.6 2.6	6.58	.01	55.7 0.0
20.4	31.26	.08	11.9 1.4	12.30	.06	15.7 1.0	6.97	.04	37.7 0.1	20.07	.19	72.2 2.6	6.59	.04	55.8 0.1
30.4	31.18	.14	13.1 1.2	12.24	.12	16.5 0.8	6.93	.09	37.5 0.2	19.88	.30	74.5 2.3	6.55	.09	56.0 0.2
Feb. 9.4	31.04	.19	14.2 0.9	12.12	.16	17.3 0.6	6.84	.13	37.3 0.1	19.58	.40	76.6 2.1	6.46	.12	56.1 0.1
19.3	30.85	.23	15.1 0.6	11.96	.20	17.9 0.5	6.71	.16	37.2 0.1	19.18	.47	78.4 1.3	6.34	.17	56.3 0.2
29.3	30.62	.25	15.7 0.4	11.76	.22	18.4 0.2	6.55	.18	37.1 0.1	18.71	.54	79.7 0.8	6.17	.18	56.5 0.1
Mar. 10.3	30.37	.26	16.1 0.1	11.54	.24	18.6 0.1	6.37	.19	37.0 0.0	18.17	.56	80.5 0.4	5.99	.20	56.6 0.1
20.3	30.11	.26	16.2 0.2	11.30	.23	18.7 0.2	6.18	.18	37.0 0.1	17.61	.56	80.9 0.1	5.79	.19	56.7 0.0
30.2	29.85	.25	16.0 0.5	11.07	.21	18.5 0.3	6.00	.18	37.1 0.0	17.05	.53	80.8 0.6	5.60	.19	56.7 0.1
Apr. 9.2	29.60	.21	15.5 0.7	10.86	.19	18.2 0.5	5.82	.16	37.1 0.1	16.52	.49	80.2 1.1	5.41	.17	56.6 0.0
19.2	29.39	.17	14.8 1.0	10.67	.15	17.7 0.7	5.66	.13	37.2 0.1	16.03	.41	79.1 1.5	5.24	.13	56.6 0.1
29.1	29.22	.12	13.8 1.1	10.52	.10	17.0 0.8	5.53	.09	37.3 0.2	15.62	.33	77.6 1.8	5.11	.10	56.5 0.2
May 9.1	29.10	.07	12.7 1.2	10.42	.06	16.2 0.8	5.44	.05	37.5 0.3	15.29	.23	75.8 2.1	5.01	.06	56.3 0.1
19.1	29.03	.01	11.5 1.3	10.36	.00	15.4 0.9	5.39	.01	37.8 0.3	15.06	.12	73.7 2.3	4.95	.02	56.2 0.1
29.1	29.02	.05	10.2 1.2	10.36	.05	14.5 0.9	5.38	.03	38.1 0.4	14.94	.01	71.4 2.4	4.93	.03	56.1 0.0
June 8.0	29.07	.10	9.0 1.3	10.41	.10	13.6 0.8	5.41	.08	38.5 0.4	14.93	.10	69.0 2.5	4.96	.07	56.1 0.0
18.0	29.17	.16	7.7 1.2	10.51	.14	12.8 0.8	5.49	.11	38.9 0.6	15.03	.21	66.5 2.4	5.03	.12	56.1 0.0
28.0	29.33	.21	6.5 1.1	10.65	.19	12.0 0.7	5.60	.15	39.5 0.5	15.24	.31	64.1 2.4	5.15	.15	56.1 0.1
July 8.0	29.54	.26	5.4 1.0	10.84	.23	11.3 0.5	5.75	.19	40.0 0.6	15.55	.40	61.7 2.2	5.30	.19	56.2 0.2
17.9	29.80	.29	4.4 0.8	11.07	.27	10.8 0.5	5.94	.21	40.6 0.6	15.95	.49	59.5 2.0	5.49	.22	56.4 0.1
27.9	30.09	.32	3.6 0.7	11.34	.29	10.3 0.4	6.15	.23	41.2 0.6	16.44	.57	57.5 1.8	5.71	.24	56.5 0.2
Aug. 6.9	30.41	.35	2.9 0.5	11.63	.31	9.9 0.3	6.38	.26	41.8 0.5	17.01	.62	55.7 1.5	5.95	.26	56.7 0.2
16.8	30.76	.37	2.4 0.4	11.94	.33	9.6 0.1	6.64	.27	42.3 0.5	17.63	.68	54.2 1.2	6.21	.28	56.9 0.2
26.8	31.13	.38	2.0 0.3	12.27	.34	9.5 0.1	6.91	.27	42.8 0.3	18.31	.71	53.0 0.9	6.49	.29	57.1 0.1
Sept. 5.8	31.51	.39	1.7 0.0	12.61	.35	9.4 0.0	7.18	.30	43.1 0.2	19.02	.75	52.1 0.5	6.78	.30	57.2 0.0
15.8	31.90	.40	1.7 0.0	12.96	.36	9.4 0.0	7.48	.29	43.3 0.0	19.77	.76	51.6 0.2	7.08	.31	57.2 0.0
25.7	32.30	.39	1.7 0.3	13.32	.35	9.4 0.2	7.77	.29	43.3 0.1	20.53	.76	51.4 0.2	7.39	.31	57.2 0.1
Oct. 5.7	32.69	.39	2.0 0.1	13.67	.35	9.6 0.2	8.06	.29	43.2 0.3	21.29	.75	51.6 0.5	7.70	.30	57.1 0.2
15.7	33.08	.38	2.4 0.5	14.02	.34	9.8 0.3	8.35	.29	42.9 0.4	22.04	.73	52.1 0.9	8.00	.30	56.9 0.2
25.7	33.46	.35	2.9 0.7	14.36	.32	10.1 0.4	8.64	.27	42.5 0.5	22.77	.69	53.0 1.3	8.30	.29	56.7 0.3
Nov. 4.6	33.81	.34	3.6 0.9	14.68	.30	10.5 0.5	8.91	.25	42.0 0.5	23.46	.64	54.3 1.6	8.59	.27	56.4 0.3
14.6	34.15	.29	4.5 1.0	14.98	.27	11.0 0.7	9.16	.23	41.5 0.7	24.10	.57	55.9 1.9	8.86	.25	56.1 0.2
24.6	34.44	.26	5.5 1.1	15.25	.24	11.7 0.7	9.39	.20	40.8 0.6	24.67	.49	57.8 2.2	9.11	.22	55.9 0.2
Dec. 4.5	34.70	.21	6.6 1.3	15.49	.19	12.4 0.8	9.59	.17	40.2 0.6	25.16	.38	60.0 2.5	9.33	.19	55.7 0.2
14.5	34.91	.15	7.9 1.4	15.63	.14	13.2 0.9	9.76	.13	39.6 0.5	25.54	.27	62.5 2.5	9.52	.14	55.5 0.1
24.5	35.06	.08	9.3 1.4	15.82	.08	14.1 0.9	9.89	.08	39.1 0.4	25.81	.15	65.0 2.7	9.66	.09	55.4 0.0
34.5	35.14		10.7	15.90		15.0	9.97		38.7	25.96		67.7	9.75		

# FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\mu$ Geminorum.		$\psi$ Aurigæ.		$\alpha$ Argus. (Canopus.)		$\nu$ Geminorum.		$\gamma$ Geminorum.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	h m 6 17	° +22 33	h m 6 17	° +49 19	h m 6 21	° -52 38	h m 6 23	° +20 16	h m 6 32	° +16 28
Jan. 0.5	10.70	37.3	32.50	65.0	51.59	46.8	17.27	13.1	11.45	42.6
10.5	10.77	37.3	32.59	66.6	51.57	50.2	17.35	12.9	11.53	42.2
20.4	10.79	37.4	32.60	68.2	51.48	53.4	17.37	12.9	11.56	41.9
30.4	10.75	37.5	32.54	69.7	51.32	56.3	17.34	12.9	11.54	41.7
Feb. 9.4	10.67	37.7	32.41	71.2	51.09	58.8	17.27	13.0	11.47	41.6
19.4	10.55	37.9	32.23	72.4	50.82	60.9	17.15	13.1	11.36	41.6
29.3	10.39	38.1	31.99	73.3	50.50	62.5	17.00	13.2	11.22	41.6
Mar. 10.3	10.21	38.2	31.73	74.0	50.16	63.5	16.82	13.4	11.05	41.7
20.3	10.02	38.3	31.44	74.4	49.80	64.1	16.63	13.5	10.86	41.8
30.2	9.82	38.4	31.15	74.4	49.43	64.1	16.44	13.6	10.67	41.9
Apr. 9.2	9.63	38.4	30.88	74.1	49.07	63.6	16.25	13.6	10.49	42.0
19.2	9.46	38.3	30.63	73.5	48.74	62.6	16.08	13.7	10.32	42.1
29.2	9.32	38.2	30.42	72.6	48.44	61.2	15.94	13.7	10.18	42.2
May 9.1	9.22	38.1	30.26	71.5	48.18	59.3	15.83	13.7	10.07	42.4
19.1	9.15	38.0	30.15	70.2	47.96	57.0	15.76	13.7	9.99	42.6
29.1	9.13	38.0	30.10	68.8	47.80	54.3	15.74	13.7	9.96	42.8
June 8.1	9.15	37.9	30.12	67.3	47.70	51.4	15.75	13.8	9.97	43.1
18.0	9.21	37.9	30.19	65.8	47.66	48.3	15.81	13.9	10.01	43.4
28.0	9.32	37.9	30.33	64.3	47.68	45.1	15.91	14.0	10.10	43.7
July 8.0	9.47	38.0	30.52	62.8	47.77	41.8	16.05	14.2	10.23	44.1
17.9	9.65	38.1	30.76	61.5	47.91	38.6	16.22	14.4	10.39	44.5
27.9	9.86	38.2	31.04	60.2	48.10	35.5	16.42	14.6	10.58	44.9
Aug. 6.9	10.09	38.3	31.36	59.1	48.35	32.6	16.64	14.8	10.79	45.2
16.9	10.35	38.4	31.71	58.2	48.64	30.1	16.89	15.0	11.03	45.5
26.8	10.62	38.5	32.09	57.4	48.97	28.1	17.16	15.2	11.28	45.7
Sept. 5.8	10.91	38.6	32.49	56.7	49.33	26.5	17.44	15.2	11.55	45.9
15.8	11.21	38.5	32.91	56.3	49.71	25.5	17.73	15.2	11.84	45.9
25.8	11.52	38.4	33.34	56.1	50.11	25.2	18.03	15.1	12.13	45.7
Oct. 5.7	11.83	38.3	33.77	56.0	50.52	25.4	18.34	14.9	12.43	45.5
15.7	12.14	38.0	34.20	56.2	50.92	26.3	18.65	14.6	12.73	45.1
25.7	12.44	37.7	34.62	56.5	51.30	27.8	18.95	14.2	13.02	44.5
Nov. 4.6	12.74	37.4	35.02	57.1	51.66	29.9	19.24	13.7	13.31	43.9
14.6	13.01	37.1	35.40	57.9	51.99	32.5	19.52	13.3	13.59	43.3
24.6	13.27	36.8	35.75	58.9	52.27	35.5	19.77	12.8	13.84	42.6
Dec. 4.6	13.50	36.6	36.06	60.1	52.49	38.8	20.00	12.4	14.07	41.9
14.5	13.69	36.4	36.31	61.5	52.65	42.3	20.20	12.1	14.27	41.3
24.5	13.84	36.3	36.50	63.0	52.75	45.8	20.35	11.8	14.43	40.7
34.5	13.94	36.3	36.63	64.6	52.77	49.3	20.45	11.6	14.54	40.3

# FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

345

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	♊ Geminorum.			♈ Aurigæ.			α Canis Majoris. (Sirius.)			♊ Geminorum.			♊ Mensæ.		
	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion South.
	h	m	° ' "	h	m	° ' "	h	m	° ' "	h	m	° ' "	h	m	° ' "
	6	38	+25 13	6	39	+43 40	6	40	-16 35	6	46	+34 4	6	47	-80 42
	s		"	s		"	s		"	s		"	s		"
Jan. 0.5	3.10		24.6	51.18		13.1	56.51		13.0	29.41		27.2	71.86		54.3
10.5	3.19	.09	24.7	51.29	.11	13.1	56.57	.06	15.3	29.52	.11	27.9	71.60	.26	57.9
20.5	3.23	.04	25.0	51.33	.04	14.4	56.58	.01	17.5	29.57	.05	28.6	71.09	.51	61.3
30.4	3.22	.01	25.3	51.31	.02	15.8	56.54	.04	19.5	29.56	.01	29.4	70.34	.75	64.5
Feb. 9.4	3.15	.07	25.6	51.22	.09	17.1	56.46	.08	21.2	29.50	.06	30.3	69.37	.97	67.3
		.11	25.6	51.22	.14	18.4		.12	21.2		.12	30.3		1.14	2.5
19.4	3.04		26.0	51.08		19.5	56.34		22.6	29.38		31.1	68.23		69.8
29.3	2.89	.15	26.3	50.89	.19	20.5	56.18	.16	23.7	29.22	.16	31.8	66.93	1.30	71.8
Mar. 10.3	2.72	.17	26.6	50.67	.22	21.3	56.00	.18	24.4	29.03	.19	32.3	65.53	1.40	73.4
20.3	2.52	.20	26.9	50.42	.25	21.8	55.81	.19	24.8	28.82	.21	32.8	64.05	1.48	74.4
30.3	2.32	.20	27.1	50.16	.26	22.0	55.60	.21	24.9	28.60	.22	33.0	62.53	1.52	74.9
		.19	27.1	50.16	.25	22.0		.20	24.9		.21	33.0		1.51	0.0
Apr. 9.2	2.13		27.1	49.91		22.0	55.40		24.7	28.39		33.1	61.02		74.9
19.2	1.95	.16	27.1	49.68	.23	21.7	55.22	.18	24.2	28.19	.20	33.0	59.55	1.47	74.4
29.2	1.79	.16	27.0	49.48	.20	21.1	55.06	.16	23.4	28.02	.17	32.7	58.16	1.39	73.4
May 9.1	1.67	.12	26.9	49.32	.16	20.4	54.92	.14	22.3	27.88	.14	32.3	56.87	1.29	71.9
19.1	1.59	.08	26.7	49.21	.11	19.4	54.82	.10	20.9	27.78	.10	31.8	55.71	1.16	70.0
		.04	26.7	49.21	.06	19.4		.06	20.9		.06	31.8		0.99	2.4
29.1	1.55	.00	26.5	49.15		18.4	54.76		19.3	27.72		31.2	54.72		67.6
June 8.1	1.55	.00	26.3	49.14	.01	17.2	54.73	.03	17.5	27.71	.01	30.5	53.91	0.81	65.0
18.0	1.60	.05	26.1	49.19	.05	16.0	54.74	.01	15.6	27.75	.04	29.8	53.31	0.60	62.1
28.0	1.68	.08	25.9	49.29	.10	14.7	54.80	.06	13.5	27.84	.09	29.1	52.92	0.39	58.9
July 8.0	1.81	.13	25.8	49.43	.14	13.5	54.89	.09	11.4	27.97	.13	28.4	52.77	0.15	55.7
		.16	25.8	49.43	.20	13.5		.12	11.4		.16	28.4		0.08	3.3
18.0	1.97	.20	25.7	49.63		12.3	55.01		9.4	28.13		27.7	52.85		52.4
27.9	2.17	.22	25.5	49.86	.23	11.2	55.17	.16	7.4	28.33	.20	27.1	53.16	0.31	49.2
Aug. 6.9	2.39	.25	25.4	50.13	.27	10.2	55.35	.18	5.5	28.57	.24	26.5	53.69	0.53	46.2
16.9	2.64	.25	25.3	50.43	.30	9.3	55.56	.21	3.9	28.83	.26	25.9	54.43	0.74	43.5
26.9	2.91	.27	25.1	50.76	.33	8.4	55.80	.24	2.6	29.12	.29	25.3	55.37	0.94	41.1
		.29	25.1	50.76	.35	8.4		.25	2.6		.30	25.3		1.10	1.9
Sept. 5.8	3.20		25.0	51.11		7.7	56.05		1.6	29.42		24.8	56.47		39.2
15.8	3.49	.29	24.8	51.48	.37	7.1	56.31	.26	0.9	29.74	.32	24.3	57.69	1.22	37.8
25.8	3.80	.31	24.5	51.86	.38	6.6	56.59	.28	0.7	30.08	.34	23.9	59.01	1.32	37.0
Oct. 5.7	4.12	.32	24.2	52.25	.39	6.3	56.87	.28	1.0	30.42	.34	23.5	60.38	1.37	36.9
15.7	4.44	.32	23.8	52.65	.40	6.1	57.16	.29	1.7	30.77	.35	23.1	61.74	1.36	37.4
		.31	23.8	52.65	.39	6.1		.28	1.7		.35	23.1		1.31	1.1
25.7	4.75		23.4	53.04		6.1	57.44		2.8	31.12		22.9	63.05		38.5
Nov. 4.7	5.06	.31	23.0	53.42	.38	6.2	57.72	.28	4.3	31.46	.34	22.7	64.27	1.22	40.2
14.6	5.36	.30	22.7	53.79	.37	6.6	57.98	.26	6.2	31.78	.32	22.6	65.34	1.07	42.5
24.6	5.64	.28	22.4	54.13	.34	7.1	58.22	.24	8.3	32.09	.31	22.6	66.23	0.89	45.2
Dec. 4.6	5.89	.25	22.2	54.43	.30	7.9	58.44	.22	10.6	32.37	.28	22.8	66.90	0.67	48.3
		.22	22.2	54.43	.26	7.9		.18	10.6		.24	22.8		0.43	3.4
14.6	6.11		22.0	54.69		8.8	58.62		13.1	32.61		23.1	67.33		51.7
24.5	6.28	.17	22.0	54.90	.21	9.9	58.76	.14	15.5	32.81	.20	23.6	67.50	0.17	55.3
34.5	6.40	.12	22.1	55.05	.15	11.2	58.85	.09	17.9	32.96	.15	24.3	67.40	0.70	58.8

# FIXED STARS, 1904

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	♄ Canis Majoris.		♊ Geminorum.		♄ Canis Majoris.		♌ Aurigæ.		♐ Volantis.		
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	
	h m 6 54	° ' " -28 50	h m 6 58	° ' " +20 42	h m 7 4	° ' " -26 14	h m 7 5	° ' " +39 28	h m 7 9	° ' " -70 20	
	s	"	s	"	s	"	s	"	s	"	
Jan. 0.5	52.85	38.0	26.40	29.7	30.87	35.3	4.93	26.9	38.31	41.9	
10.5	52.91 .06	40.9 2.9	26.51 .11	29.5 .02	30.95 .08	38.2 2.9	5.06 .13	27.9 1.0	38.31 .00	45.6 3.7	
20.5	52.92 .01	43.6 2.7	26.57 .06	29.4 .01	30.98 .03	40.8 2.6	5.14 .08	28.9 1.0	38.18 .13	49.2 3.6	
30.4	52.88 .04	46.1 2.5	26.58 .01	29.4 .00	30.95 .03	43.3 2.5	5.15 .01	30.1 1.2	37.93 .25	52.7 3.5	
Feb. 9.4	52.79 .09	48.3 2.2	26.54 .04	29.4 .02	30.88 .07	45.5 2.2	5.10 .05	31.2 1.1	37.56 .37	55.8 3.1	
	52.79 .13	48.3 1.9	26.54 .10	29.6 .02	30.88 .12	45.5 1.8	5.10 .11	31.2 1.1	37.56 .46	55.8 2.7	
	19.4	52.66	50.2	26.44	29.8	30.76	47.3	4.99	32.3	37.10	58.5
	29.4	52.49	51.7 1.5	26.31	30.0 .02	30.60 .16	48.8 1.5	4.84 .15	33.3 1.0	36.55 .55	60.8 2.3
Mar. 10.3	52.29 .20	52.8 1.1	26.15 .16	30.3 .03	30.41 .19	49.9 1.1	4.64 .20	34.2 0.9	35.94 .61	62.7 1.9	
20.3	52.07 .22	53.5 0.7	25.97 .18	30.3 .03	30.20 .21	50.6 0.7	4.42 .22	34.8 0.6	35.28 .66	64.0 1.3	
30.3	51.84 .23	53.7 0.2	25.78 .19	30.6 .02	29.99 .21	50.9 0.3	4.19 .23	35.2 0.4	34.59 .69	64.8 0.8	
	51.84 .22	53.7 0.1	25.78 .19	30.8 .02	29.99 .22	50.9 0.1	4.19 .23	35.2 0.2	34.59 .69	64.8 0.3	
Apr. 9.2	51.62 .22	53.6 0.5	25.59 .18	31.0 .01	29.77 .21	50.8 0.4	3.96 .22	35.4 0.0	33.90 .68	65.1 0.2	
19.2	51.40 .19	53.1 1.0	25.41 .16	31.1 .01	29.56 .19	50.4 0.8	3.74 .20	35.4 0.2	33.22 .65	64.9 0.8	
29.2	51.21 .17	52.1 1.3	25.25 .12	31.2 .01	29.37 .16	49.6 1.2	3.54 .17	35.2 0.5	32.57 .60	64.1 1.3	
May 9.2	51.04 .13	50.8 1.6	25.13 .10	31.3 .00	29.21 .13	48.4 1.5	3.37 .12	34.7 0.6	31.97 .54	62.8 1.8	
19.1	50.91 .09	49.2 1.9	25.03 .05	31.3 .01	29.08 .10	46.9 1.8	3.25 .08	34.1 0.8	31.43 .46	61.0 2.1	
	29.1	50.82	47.3	24.98	31.4	28.98	45.1	3.17	33.3	30.97	58.9
June 8.1	50.76 .06	45.1 2.2	24.96 .03	31.4 .00	28.92 .06	43.0 2.1	3.14 .03	32.4 0.9	30.59 .38	56.3 2.6	
18.1	50.75 .01	42.7 2.4	24.99 .02	31.4 .01	28.90 .02	40.8 2.2	3.16 .02	31.4 1.0	30.31 .28	53.4 2.9	
28.0	50.77 .02	40.2 2.5	25.05 .06	31.5 .00	28.90 .02	40.8 2.4	3.16 .06	31.4 1.1	30.31 .18	53.4 3.1	
July 8.0	50.77 .07	40.2 2.6	25.05 .11	31.5 .01	28.92 .06	38.4 2.5	3.22 .12	30.3 1.0	30.13 .08	50.3 3.3	
	50.84 .11	37.6 2.6	25.16 .14	31.6 .00	28.98 .10	35.9 2.5	3.34 .15	29.3 1.1	30.05 .04	47.0 3.3	
	18.0	50.95	35.0	25.30	31.6	29.08	33.4	3.49	28.2	30.09	43.7
28.0	51.09 .14	32.5 2.5	25.46 .16	31.7 .01	29.22 .14	31.0 2.4	3.69 .20	27.2 1.0	30.23 .14	40.4 3.3	
Aug. 6.9	51.26 .17	30.1 2.4	25.66 .20	31.7 .00	29.22 .16	31.0 2.2	3.69 .23	27.2 1.0	30.23 .24	40.4 3.1	
16.9	51.47 .21	30.1 2.1	25.66 .23	31.7 .01	29.38 .20	28.8 2.1	3.92 .26	26.2 1.0	30.47 .35	37.3 2.9	
26.9	51.47 .23	28.0 1.7	25.89 .24	31.6 .01	29.58 .22	26.7 1.7	4.18 .29	25.2 0.9	30.82 .44	34.4 2.6	
	51.70 .26	26.3 1.4	26.13 .27	31.5 .01	29.80 .25	25.0 1.4	4.47 .31	24.3 0.8	31.26 .52	31.8 2.1	
Sept. 5.8	51.96 .28	24.9 1.0	26.40 .28	31.4 .03	30.05 .26	23.6 0.9	4.78 .33	23.5 0.8	31.78 .59	29.7 1.6	
15.8	52.24 .29	23.9 0.4	26.68 .29	31.1 .03	30.31 .29	22.7 0.5	5.11 .35	22.7 0.7	32.37 .65	28.1 1.1	
25.8	52.53 .30	23.5 0.1	26.97 .30	30.8 .05	30.60 .29	22.2 0.1	5.46 .37	22.0 0.6	33.02 .67	27.0 0.4	
Oct. 5.8	52.83 .31	23.6 0.6	27.27 .31	30.3 .05	30.89 .31	22.3 0.5	5.83 .37	21.4 0.5	33.69 .69	26.6 0.3	
15.7	53.14 .30	24.2 1.1	27.58 .31	29.8 .06	31.20 .30	22.8 1.2	6.20 .37	20.9 0.4	34.38 .68	26.9 0.9	
	25.7	53.44	25.3	27.89	29.2	31.50	24.0	6.57	20.5	35.06	27.8
Nov. 4.7	53.74 .30	26.9 1.6	28.20 .31	28.5 .07	31.80 .30	25.5 1.5	6.94 .37	20.2 0.3	35.71 .65	29.4 1.6	
14.7	54.02 .28	29.0 2.1	28.50 .30	28.5 .06	31.80 .28	25.5 2.0	6.94 .36	20.2 0.0	35.71 .60	29.4 2.2	
24.6	54.28 .26	31.4 2.4	28.78 .28	27.9 .07	32.08 .27	27.5 2.3	7.30 .35	20.2 0.1	36.31 .52	31.6 2.7	
Dec. 4.6	54.51 .23	34.1 2.7	29.04 .26	27.2 .05	32.35 .24	29.8 2.6	7.65 .31	20.3 0.3	36.83 .43	34.3 3.1	
	54.51 .19	34.1 2.9	29.04 .23	26.7 .05	32.59 .20	32.4 2.8	7.96 .28	20.6 0.5	37.26 .32	37.4 3.4	
	14.6	54.70	37.0	29.27	26.2	32.79	35.2	8.24	21.1	37.58	40.8
24.5	54.85 .15	39.9 2.9	29.46 .19	25.8 .04	32.95 .16	38.1 2.9	8.47 .23	21.8 0.7	37.78 .20	44.4 3.6	
34.5	54.95 .10	42.9 3.0	29.60 .14	25.5 .03	33.06 .11	40.9 2.8	8.64 .17	22.7 0.9	37.86 .08	48.1 3.7	

# FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

34

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	25 Camelop. (H.).			δ Geminorum.			Piazzi vii, 67.			β Canis Minoris.			α <sup>2</sup> Geminorum. (Castor.)		
	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.
	h m	s	°	h m	s	°	h m	s	°	h m	s	°	h m	s	°
	7 10		+82 35	7 14		+22 9	7 20		+68 39	7 21		+ 8 28	7 28		+32 5
Jan. 0.5	64.37		38.7	24.88		22.1	57.08		30.6	58.10		47.8	30.04		45.8
10.5	64.86	0.49	41.8	25.01	0.13	21.9	57.34	0.26	33.1	58.22	0.12	46.8	30.19	0.15	46.2
20.5	65.01	0.15	44.9	25.09	0.08	21.9	57.47	0.13	35.7	58.29	0.07	45.9	30.29	0.10	46.8
30.5	64.81	0.20	47.9	25.11	0.02	22.0	57.47	0.26	38.3	58.32	0.03	45.2	30.33	0.04	47.5
Feb. 9.4	64.27	0.54	50.8	25.08	0.03	22.3	57.35	0.12	40.8	58.29	0.25	44.7	30.31	0.07	48.3
		0.85	2.6		0.08	0.3		0.24	2.3		0.07	0.4			0.8
19.4	63.42		53.4	25.00		22.6	57.11		43.1	58.22		44.3	30.24		49.1
29.4	62.31	1.11	55.6	24.88	0.12	22.9	56.77	0.34	45.1	58.11	0.11	44.1	30.12	0.12	49.9
Mar. 10.3	60.98	1.33	57.4	24.73	0.15	23.3	56.34	0.43	46.8	57.97	0.14	44.0	29.96	0.16	50.7
20.3	59.49	1.49	58.7	24.55	0.18	23.6	55.85	0.49	48.1	57.80	0.17	44.0	29.77	0.19	51.3
30.3	57.91	1.58	59.4	24.36	0.19	23.9	55.33	0.52	48.9	57.63	0.17	44.1	29.56	0.21	51.9
		1.59	0.1		0.19	0.3		0.54	0.3		0.18	0.2			0.3
Apr. 9.3	56.32		59.5	24.17		24.2	54.79		49.2	57.45		44.3	29.35		52.2
19.2	54.76	1.56	59.0	23.99	0.18	24.4	54.27	0.52	49.0	57.28	0.17	44.6	29.15	0.20	52.4
29.2	53.31	1.45	58.0	23.82	0.17	24.5	53.79	0.48	48.3	57.12	0.16	45.0	28.97	0.18	52.5
May 9.2	52.02	1.09	56.5	23.68	0.14	24.6	53.36	0.43	47.2	56.99	0.13	45.4	28.81	0.16	52.4
19.2	50.93	1.29	54.5	23.58	0.10	24.6	53.01	0.35	47.2	56.88	0.15	45.9	28.68	0.13	52.1
		0.85	2.3		0.07	0.0		0.27	1.8		0.07	0.6		0.08	0.4
29.1	50.08		52.2	23.51		24.6	52.74		43.9	56.81		46.5	28.60		51.7
June 8.1	49.49	0.59	49.6	23.49	0.02	24.6	52.56	0.18	41.8	56.78	0.03	47.1	28.55	0.05	51.2
18.1	49.18	0.31	46.8	23.50	0.01	24.5	52.48	0.08	39.5	56.78	0.00	47.8	28.55	0.04	50.6
28.0	49.16	0.02	43.8	23.55	0.05	24.5	52.50	0.02	37.0	56.82	0.04	48.5	28.59	0.07	50.0
July 8.0	49.42	0.26	40.7	23.64	0.09	24.4	52.63	0.13	35.5	56.89	0.07	49.2	28.66	0.07	49.3
		0.55	3.0		0.12	0.1		0.22	2.6		0.11	0.7		0.12	0.7
18.0	49.97	0.80	37.7	23.76	0.15	24.3	52.85	0.31	31.9	57.00	0.13	49.9	28.78	0.16	48.6
28.0	50.77	1.05	34.8	23.91	0.19	24.2	53.16	0.39	29.4	57.13	0.17	50.5	28.94	0.19	47.9
Aug. 6.9	51.82	1.28	32.1	24.10	0.21	24.1	53.55	0.27	27.0	57.30	0.19	51.1	29.13	0.21	47.2
16.9	53.10	1.48	29.5	24.31	0.24	23.9	54.02	0.54	24.7	57.49	0.21	51.6	29.34	0.25	46.4
26.9	54.58	1.64	27.2	24.55	0.26	23.7	54.56	0.59	22.7	57.70	0.23	51.9	29.59	0.27	45.6
			1.9		0.26	0.3		0.59	1.9		0.23	0.2		0.27	0.8
Sept. 5.9	56.22		25.3	24.81		23.4	55.15		20.8	57.93		52.1	29.86		44.8
15.8	58.01	1.79	23.7	25.08	0.27	23.0	55.80	0.65	19.2	58.18	0.25	52.1	30.15	0.29	44.0
25.8	59.91	1.90	22.5	25.37	0.29	22.5	56.49	0.69	17.9	58.45	0.28	51.9	30.46	0.31	43.2
Oct. 5.8	61.89	1.98	21.7	25.68	0.31	21.9	57.21	0.72	17.0	58.73	0.29	51.4	30.78	0.34	42.4
15.7	63.90	2.01	21.4	25.99	0.32	21.3	57.95	0.75	16.4	59.02	0.30	50.8	31.12	0.35	41.6
		2.01	0.1		0.32	0.7		0.75	0.2		0.30	0.9		0.35	0.7
25.7	65.91	1.96	21.5	26.31	0.31	20.6	58.70	0.74	16.2	59.32	0.30	49.9	31.47	0.35	40.9
Nov. 4.7	67.87	1.87	22.1	26.62	0.31	19.8	59.44	0.72	16.4	59.62	0.29	48.8	31.82	0.34	40.3
14.7	69.74	1.73	23.2	26.93	0.30	19.1	60.16	0.67	17.0	59.91	0.27	47.7	32.16	0.33	39.8
24.6	71.47	1.54	24.8	27.23	0.27	18.4	60.83	0.62	18.1	60.18	0.26	46.4	32.49	0.30	39.4
Dec. 4.6	73.01	1.30	26.8	27.50	0.24	17.8	61.45	0.54	19.5	60.44	0.23	45.1	32.79	0.28	39.2
			2.4		0.24	0.5		0.54	1.8		0.23	1.2		0.28	0.1
14.6	74.31	1.02	29.2	27.74	0.21	17.3	61.99	0.44	21.3	60.67	0.20	43.9	33.07	0.24	39.1
24.6	75.33	0.71	31.9	27.95	0.16	17.0	62.43	0.34	23.4	60.87	0.15	42.7	33.31	0.18	39.3
34.5	76.04		34.8	28.11		16.7	62.77		25.8	61.02		41.6	33.49		39.6

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	<i>α</i> Canis Minoris. (Procyon.)		<i>β</i> Geminorum. (Pollux.)		<i>φ</i> Geminorum.		<i>z</i> 6 Lyncis.		Groombridge 1374.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 7 34	° ' " + 5 27	h m 7 39	° ' " + 28 15	h m 7 47	° ' " + 27 0	h m 7 47	° ' " + 47 48	h m 7 48	° ' " + 74 9
Jan. 0.6	18.00	64.4	27.98	17.4	38.80	39.8	45.23	35.4	46.81	74.3
10.5	18.13	63.1	28.14	17.5	38.97	39.8	45.44	36.7	47.22	76.8
20.5	18.21	62.0	28.25	17.8	39.08	40.0	45.58	38.2	47.46	79.6
30.5	18.24	61.3	28.30	18.3	39.14	40.4	45.65	39.8	47.54	82.4
Feb. 9.4	18.23	60.3	28.29	18.9	39.14	41.0	45.64	41.4	47.44	85.2
19.4	18.17	59.7	28.23	19.5	39.09	41.6	45.57	43.1	47.19	87.9
29.4	18.06	59.3	28.12	20.2	38.99	42.2	45.43	44.7	46.79	90.3
Mar. 10.4	17.92	59.1	27.97	20.9	38.85	42.9	45.24	46.1	46.27	92.3
20.3	17.76	59.0	27.80	21.5	38.69	43.5	45.01	47.2	45.65	93.9
30.3	17.59	59.1	27.60	22.0	38.50	44.0	44.75	48.1	44.97	95.1
Apr. 9.3	17.41	59.3	27.40	22.5	38.31	44.5	44.49	48.7	44.25	95.8
19.3	17.24	59.5	27.21	22.7	38.12	44.8	44.22	49.0	43.54	95.9
29.2	17.08	59.9	27.03	22.9	37.94	45.0	43.97	49.0	42.85	95.5
May 9.2	16.94	60.4	26.87	22.9	37.78	45.1	43.75	48.6	42.22	94.6
19.2	16.83	60.9	26.75	22.8	37.65	45.1	43.57	48.0	41.67	93.2
29.1	16.75	61.6	26.66	22.6	37.56	45.0	43.43	47.1	41.21	91.5
June 8.1	16.70	62.3	26.60	22.3	37.50	44.8	43.34	46.0	40.87	89.4
18.1	16.69	63.0	26.59	22.0	37.48	44.5	43.29	44.7	40.65	87.0
28.0	16.72	63.8	26.62	21.6	37.50	44.2	43.30	43.2	40.56	84.3
July 8.0	16.77	64.7	26.68	21.1	37.56	43.8	43.37	41.6	40.60	81.6
18.0	16.86	65.5	26.78	20.6	37.65	43.3	43.48	40.0	40.77	78.8
28.0	16.98	66.2	26.92	20.1	37.78	42.8	43.64	38.4	41.07	75.9
Aug. 7.0	17.13	66.9	27.09	19.5	37.94	42.2	43.84	36.7	41.48	73.1
16.9	17.31	67.5	27.29	18.9	38.13	41.6	44.08	35.0	42.00	70.4
26.9	17.51	67.9	27.52	18.2	38.35	41.0	44.36	33.4	42.62	67.9
Sept. 5.9	17.73	68.1	27.77	17.5	38.59	40.3	44.68	31.9	43.33	65.6
15.8	17.97	68.1	28.04	16.7	38.86	39.5	45.02	30.4	44.12	63.6
25.8	18.23	67.9	28.33	15.9	39.14	38.7	45.39	29.1	44.98	61.9
Oct. 5.8	18.50	67.4	28.64	15.1	39.45	37.8	45.79	27.9	45.90	60.5
15.8	18.79	66.7	28.96	14.2	39.77	36.9	46.20	26.9	46.85	59.5
25.7	19.08	65.8	29.29	13.4	40.10	36.0	46.63	26.1	47.83	59.0
Nov. 4.7	19.38	64.6	29.63	12.6	40.43	35.1	47.06	25.6	48.81	58.8
14.7	19.67	63.3	29.96	11.8	40.76	34.2	47.49	25.3	49.77	59.2
24.7	19.95	61.9	30.28	11.2	41.09	33.5	47.90	25.3	50.68	60.0
Dec. 4.6	20.21	60.4	30.59	10.7	41.40	32.9	48.29	25.6	51.53	61.3
14.6	20.45	58.9	30.86	10.4	41.68	32.4	48.64	26.2	52.29	63.0
24.6	20.65	57.5	31.10	10.2	41.92	32.2	48.95	27.1	52.94	65.1
34.5	20.81	56.2	31.29	10.3	42.12	32.1	49.20	28.2	53.44	67.5



# FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

349

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\omega^1$ Cancri.			$\gamma$ Ursæ Maj. (H.).			$\gamma$ Argûs ( $\rho$ .)			$\zeta^1$ Cancri.			$\beta^3$ Cancri.		
	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.
	h	m	°	h	m	°	h	m	°	h	m	°	h	m	°
	7	55	+25 39	8	3	+68 44	8	3	-24 1	8	6	+17 55	8	11	+9 28
	s	"	"	s	"	"	s	"	"	s	"	"	s	"	"
Jan. 0.6	8.76	.17	8.3	18.74	.36	69.6	28.90	.15	44.6	43.72	.18	63.3	19.85	.17	43.1
10.5	8.93	.12	8.2	19.10	.24	71.9	29.05	.09	47.5	43.90	.13	62.7	20.02	.12	41.9
20.5	9.05	.07	8.3	19.34	.11	74.4	29.14	.04	50.2	44.03	.07	62.3	20.14	.07	41.0
30.5	9.12	.01	8.6	19.45	.01	77.0	29.18	.01	52.8	44.10	.02	62.1	20.21	.03	40.2
Feb. 9.5	9.13	.04	9.1	19.44	.15	79.6	29.17	.06	55.2	44.12	.03	62.1	20.24	.03	39.7
19.4	9.09	.09	9.6	19.29	.25	82.2	29.11	.11	57.2	44.09	.08	62.2	20.21	.07	39.3
29.4	9.00	.14	10.2	19.04	.36	84.6	29.00	.14	59.0	44.01	.11	62.4	20.14	.11	39.1
Mar. 10.4	8.86	.16	10.9	18.68	.43	86.6	28.86	.17	60.4	43.90	.15	62.7	20.03	.14	39.1
20.3	8.70	.18	11.5	18.25	.49	88.3	28.69	.19	61.5	43.75	.16	63.1	19.89	.16	39.2
30.3	8.52	.19	12.0	17.76	.52	89.7	28.50	.20	62.2	43.59	.18	63.0	19.73	.17	39.4
Apr. 9.3	8.33	.18	12.5	17.24	.52	90.5	28.30	.20	62.5	43.41	.17	64.0	19.56	.17	39.7
19.3	8.15	.18	12.9	16.72	.51	90.9	28.10	.19	62.5	43.24	.17	64.4	19.39	.16	40.0
29.2	7.97	.16	13.2	16.21	.48	90.7	27.91	.18	62.1	43.07	.15	64.8	19.23	.15	40.4
May 9.2	7.81	.13	13.3	15.73	.41	90.1	27.73	.15	61.4	42.92	.12	65.1	19.08	.12	40.9
19.2	7.68	.09	13.4	15.32	.35	89.1	27.58	.12	60.4	42.80	.10	65.4	18.96	.09	41.4
29.2	7.59	.06	13.3	14.97	.26	87.6	27.46	.10	59.0	42.70	.07	65.6	18.87	.07	41.9
June 8.1	7.53	.03	13.2	14.71	.18	85.7	27.36	.06	57.4	42.63	.03	65.8	18.80	.04	42.4
18.1	7.50	.01	13.0	14.53	.08	83.6	27.30	.03	55.5	42.60	.00	66.0	18.76	.00	43.0
28.1	7.51	.05	12.7	14.45	.01	81.2	27.27	.01	53.5	42.60	.04	66.1	18.76	.03	43.5
July 8.0	7.56	.09	12.4	14.46	.11	78.7	27.28	.04	51.4	42.64	.07	66.2	18.79	.06	44.1
18.0	7.65	.12	12.0	14.57	.20	76.1	27.32	.07	49.1	42.71	.10	66.3	18.85	.09	44.6
28.0	7.77	.15	11.5	14.77	.29	73.4	27.39	.11	46.9	42.81	.13	66.2	18.94	.12	45.1
Aug. 7.0	7.92	.18	11.0	15.06	.37	70.7	27.50	.14	44.8	42.94	.16	66.1	19.06	.14	45.5
16.9	8.10	.21	10.5	15.43	.45	68.1	27.64	.17	42.8	43.10	.19	65.9	19.20	.18	45.7
26.9	8.31	.23	9.8	15.88	.52	65.6	27.81	.20	41.0	43.29	.21	65.6	19.38	.20	45.9
Sept. 5.9	8.54	.26	9.1	16.40	.58	63.3	28.01	.23	39.5	43.50	.23	65.2	19.58	.22	45.8
15.9	8.80	.28	8.3	16.98	.63	61.2	28.24	.25	38.4	43.73	.26	64.7	19.80	.24	45.6
25.8	9.08	.30	7.5	17.61	.68	59.3	28.49	.28	37.7	43.99	.28	64.0	20.04	.27	45.2
Oct. 5.8	9.38	.31	6.6	18.29	.72	57.7	28.77	.29	37.5	44.27	.29	63.2	20.31	.28	44.6
15.8	9.69	.32	5.7	19.01	.74	56.5	29.06	.30	37.8	44.56	.31	62.2	20.59	.29	43.7
25.7	10.01	.33	4.7	19.75	.75	55.7	29.36	.31	38.6	44.87	.31	61.2	20.88	.31	44.7
Nov. 4.7	10.34	.34	3.7	20.50	.75	55.3	29.67	.31	39.9	45.18	.32	60.0	21.19	.30	41.5
14.7	10.68	.32	2.8	21.25	.72	55.3	29.98	.30	41.6	45.50	.32	58.9	21.49	.31	40.1
24.7	11.00	.31	2.0	21.97	.68	55.7	30.28	.28	43.7	45.82	.30	57.7	21.80	.29	38.7
Dec. 4.6	11.31	.28	1.2	22.65	.62	56.6	30.56	.26	46.1	46.12	.27	56.6	22.09	.27	37.3
14.6	11.59	.25	0.7	23.27	.54	57.9	30.82	.22	48.7	46.39	.25	55.6	22.36	.23	35.9
24.6	11.84	.21	0.3	23.81	.44	59.7	31.04	.17	51.5	46.64	.20	54.7	22.59	.20	34.6
34.6	12.05		0.1	24.25		61.8	31.21		54.4	46.84		54.0	22.79		33.3

# FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	30 Monocerotis.		# Chamæleontis.		η Cancri.		σ Hydræ.		γ Cancri.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 8 20	° ' " 3 35	h m 8 23	° ' " 77 10	h m 8 27	° ' " 20 45	h m 8 33	° ' " 3 40	h m 8 37	° ' " 21 48
Jan. 0.6	53.17	43.6	38.85	29.2	10.73	50.5	45.66	33.7	45.10	37.6
10.6	53.34	45.5	39.12	32.9	10.93	50.0	45.84	32.2	45.31	37.1
20.5	53.46	47.3	39.20	36.7	11.08	49.7	45.98	30.9	45.47	36.9
30.5	53.54	48.8	39.10	40.5	11.18	49.6	46.08	29.7	45.58	36.8
Feb. 9.5	53.56	50.2	38.82	44.1	11.22	49.7	46.12	28.7	45.64	37.0
19.4	53.54	51.3	38.37	47.6	11.21	50.0	46.11	28.0	45.64	37.3
29.4	53.47	52.1	37.76	50.8	11.15	50.4	46.06	27.5	45.59	37.8
Mar. 10.4	53.36	52.8	37.02	53.6	11.05	50.9	45.96	27.2	45.50	38.4
20.4	53.23	53.2	36.18	56.0	10.92	51.5	45.84	27.1	45.37	39.0
30.3	53.07	53.4	35.26	58.0	10.76	52.0	45.70	27.1	45.21	39.7
Apr. 9.3	52.91	53.4	34.28	59.4	10.59	52.6	45.54	27.3	45.04	40.3
19.3	52.74	53.2	33.27	60.4	10.41	53.1	45.37	27.0	44.87	40.8
29.3	52.58	52.8	32.25	60.8	10.24	53.5	45.21	27.6	44.70	41.3
May 9.2	52.43	52.2	31.25	60.7	10.09	53.9	45.07	28.5	44.54	41.7
19.2	52.30	51.5	30.29	60.1	9.95	54.2	44.94	29.1	44.40	42.0
29.2	52.20	50.7	29.40	58.9	9.84	54.4	44.83	29.8	44.29	42.3
June 8.2	52.12	49.7	28.59	57.3	9.76	54.5	44.75	30.5	44.20	42.4
18.1	52.07	48.6	27.89	55.2	9.71	54.6	44.70	31.3	44.14	42.4
28.1	52.05	47.5	27.31	52.8	9.69	54.6	44.67	32.1	44.12	42.3
July 8.1	52.06	46.3	26.87	50.0	9.71	54.5	44.68	32.9	44.13	42.2
18.0	52.11	45.0	26.58	46.9	9.76	54.4	44.72	33.7	44.17	42.0
28.0	52.18	43.8	26.45	43.8	9.85	54.1	44.78	34.4	44.24	41.7
Aug. 7.0	52.28	42.7	26.48	40.5	9.96	53.8	44.88	35.1	44.34	41.3
17.0	52.41	41.8	26.68	37.3	10.10	53.4	45.00	35.6	44.47	40.7
26.9	52.57	41.0	27.04	34.3	10.27	52.9	45.15	36.0	44.63	40.1
Sept. 5.9	52.75	40.4	27.57	31.6	10.47	52.2	45.33	36.2	44.82	39.4
15.9	52.96	40.1	28.24	29.2	10.69	51.4	45.53	36.2	45.04	38.5
25.8	53.19	40.1	29.03	27.3	10.94	50.5	45.75	35.9	45.28	37.5
Oct. 5.8	53.45	40.4	29.93	25.9	11.21	49.5	46.00	35.4	45.55	36.4
15.8	53.72	41.0	30.90	25.1	11.50	48.4	46.27	34.6	45.84	35.2
25.8	54.01	41.9	31.92	25.0	11.81	47.2	46.56	33.5	46.15	34.0
Nov. 4.7	54.30	43.2	32.95	25.6	12.13	46.0	46.86	32.3	46.47	32.7
14.7	54.60	44.7	33.95	26.8	12.46	44.7	47.17	30.8	46.80	31.3
24.7	54.90	46.4	34.88	28.6	12.78	43.5	47.47	29.2	47.13	30.1
Dec. 4.7	55.19	48.3	35.72	31.0	13.10	42.4	47.76	27.5	47.45	28.9
14.6	55.45	50.3	36.43	33.8	13.39	41.4	48.04	25.8	47.75	27.9
24.6	55.69	52.3	36.98	37.1	13.66	40.6	48.29	24.1	48.03	27.1
34.6	55.89	54.2	37.36	40.6	13.89	40.0	48.50	22.5	48.27	26.5

# FIXED STARS, 1904.

351

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ε Hydræ.		σ² Cancrī (mean).		ι Ursæ Majoris.		σ² Ursæ Majoris.		κ Cancrī.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 8 41	° ' " + 6 45	h m 8 48	° ' " + 30 56	h m 8 52	° ' " + 48 24	h m 9 1	° ' " + 67 30	h m 9 2	° ' " + 11 2
Jan. 0.6	42.77	66.5	24.52	21.3	39.60	51.1	59.19	69.7	34.01	66.4
10.6	42.97	65.2	24.76	21.3	39.89	52.1	59.66	71.5	34.23	65.2
20.5	43.12	64.0	24.94	21.6	40.12	53.3	60.03	73.6	34.40	64.2
30.5	43.22	63.0	25.07	22.1	40.28	54.8	60.29	76.0	34.53	63.4
Feb. 9.5	43.27	62.2	25.14	22.8	40.36	56.5	60.42	78.6	34.60	62.9
19.5	43.27	61.6	25.15	23.7	40.38	58.3	60.43	81.3	34.62	62.6
29.4	43.23	61.3	25.11	24.7	40.32	60.2	60.32	83.9	34.60	62.4
Mar. 10.4	43.14	61.1	25.02	25.7	40.19	62.0	60.11	86.4	34.53	62.5
20.4	43.02	61.1	24.89	26.7	40.02	63.7	59.80	88.7	34.43	62.7
30.3	42.88	61.3	24.73	27.7	39.81	65.2	59.41	90.6	34.30	63.0
Apr. 9.3	42.73	61.5	24.55	28.6	39.57	66.4	58.98	92.1	34.15	63.4
19.3	42.56	61.9	24.36	29.3	39.31	67.3	58.51	93.2	34.00	63.9
29.3	42.40	62.3	24.18	29.9	39.06	67.9	58.03	93.8	33.84	64.4
May 9.2	42.25	62.8	24.00	30.3	38.81	68.1	57.56	93.9	33.69	64.9
19.2	42.12	63.3	23.84	30.5	38.59	68.0	57.12	93.5	33.56	65.4
June 29.2	42.01	63.9	23.71	30.5	38.40	67.6	56.72	92.7	33.44	66.0
8.2	41.93	64.6	23.61	30.3	38.24	66.9	56.38	91.4	33.34	66.5
18.1	41.87	65.2	23.54	30.0	38.12	65.8	56.10	89.7	33.27	66.9
28.1	41.85	65.9	23.50	29.5	38.05	64.5	55.90	87.7	33.23	67.4
July 8.1	41.85	66.5	23.49	28.9	38.02	63.0	55.78	85.4	33.22	67.8
18.0	41.88	67.1	23.52	28.1	38.04	61.4	55.74	82.9	33.24	68.1
28.0	41.94	67.7	23.59	27.3	38.11	59.5	55.78	80.2	33.28	68.4
Aug. 7.0	42.03	68.1	23.69	26.3	38.22	57.6	55.91	77.4	33.35	68.6
17.0	42.14	68.5	23.82	25.2	38.37	55.6	56.12	74.5	33.45	68.6
26.9	42.29	68.7	23.98	24.1	38.56	53.5	56.40	71.6	33.58	68.5
Sept. 5.9	42.46	68.7	24.18	22.8	38.80	51.4	56.76	68.8	33.73	68.3
15.9	42.66	68.5	24.40	21.5	39.08	49.3	57.19	66.1	33.92	67.8
25.9	42.88	68.1	24.65	20.1	39.39	47.3	57.69	63.5	34.13	67.2
Oct. 5.8	43.12	67.5	24.93	18.7	39.74	45.4	58.25	61.2	34.36	66.3
15.8	43.39	66.6	25.24	17.2	40.12	43.7	58.86	59.2	34.62	65.3
Nov. 25.8	43.68	65.4	25.57	15.8	40.52	42.1	59.52	57.5	34.91	64.0
4.7	43.98	64.1	25.91	14.4	40.95	40.7	60.22	56.1	35.21	62.6
14.7	44.29	62.7	26.26	13.2	41.39	39.6	60.93	55.2	35.52	61.1
24.7	44.60	61.1	26.62	12.0	41.83	38.8	61.64	54.8	35.84	59.5
Dec. 4.7	44.90	59.5	26.97	11.1	42.26	38.4	62.34	54.9	36.15	57.9
14.6	45.18	57.8	27.30	10.4	42.67	38.4	63.00	55.4	36.45	56.4
24.6	45.44	56.3	27.60	9.9	43.05	38.7	63.61	56.5	36.73	54.9
34.6	45.66	54.8	27.87	9.8	43.38	39.4	64.15	58.0	36.97	53.6

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\theta$ Hydræ.			$\beta$ Argûs.			$\epsilon$ Argûs.			$\alpha$ Lyncis.			$\alpha$ Hydræ.		
	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion South.
	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "
	9 9		+ 24 2	9 12		-69 19	9 14		-58 52	9 15		+34 47	9 22		- 8 14
Jan. 0.6	23.35	.22	61.6	13.22	.35	13.5	34.00	.28	16.2	13.56	.27	40.3	53.37	.22	37.8
10.6	23.57	.17	59.9	13.57	.23	17.0	34.28	.20	19.8	13.83	.27	40.3	53.59	.18	40.0
20.6	23.74	.13	58.4	13.80	.12	20.8	34.48	.11	23.5	14.05	.22	40.7	53.77	.13	42.1
30.5	23.87	.07	57.1	13.92	.01	24.6	34.59	.04	27.3	14.21	.16	41.3	53.90	.09	44.1
Feb. 9.5	23.94	.03	56.0	13.91	.01	28.4	34.63	.05	31.0	14.31	.10	42.2	53.99	.03	45.9
19.5	23.97	.02	55.2	13.79	.22	32.1	34.58	.13	34.6	14.35	.01	43.3	54.02	.01	47.4
29.5	23.95	.06	54.6	13.57	.32	35.7	34.45	.19	37.9	14.34	.07	44.5	54.01	.05	48.6
Mar. 10.4	23.89	.10	54.2	13.25	.40	38.9	34.26	.25	41.0	14.27	.11	45.8	53.96	.08	49.6
20.4	23.79	.12	54.0	12.85	.47	41.7	34.01	.33	43.7	14.16	.15	47.1	53.87	.12	50.4
30.4	23.67	.14	54.0	12.38	.52	44.2	33.71	.34	46.0	14.01	.17	48.4	53.75	.14	50.9
Apr. 9.3	23.53	.15	54.1	11.86	.55	46.2	33.37	.36	47.8	13.84	.19	49.5	53.61	.15	51.2
19.3	23.38	.16	54.4	11.31	.58	47.7	33.01	.37	49.1	13.65	.20	50.5	53.46	.15	51.2
29.3	23.22	.14	54.8	10.73	.58	48.7	32.64	.37	50.0	13.45	.18	51.3	53.31	.15	51.0
May 9.3	23.08	.12	55.2	10.15	.57	49.2	32.27	.36	50.3	13.27	.18	51.8	53.16	.14	50.6
19.2	22.94	.11	55.8	9.58	.55	49.2	31.91	.34	50.1	13.09	.15	52.1	53.02	.13	50.0
29.2	22.83	.10	56.5	9.03	.51	48.6	31.57	.32	49.4	12.94	.12	52.2	52.89	.10	49.3
June 8.2	22.73	.08	57.2	8.52	.47	47.5	31.25	.28	48.2	12.82	.10	52.1	52.79	.09	48.4
18.2	22.65	.04	57.9	8.05	.40	45.9	30.97	.24	46.6	12.72	.07	51.7	52.70	.06	47.3
28.1	22.61	.02	58.7	7.65	.33	43.8	30.73	.20	44.5	12.65	.03	51.1	52.64	.04	46.2
July 8.1	22.59	.00	59.5	7.32	.25	41.4	30.53	.14	42.1	12.62	.00	50.3	52.60	.02	45.0
18.1	22.59	.03	60.3	7.07	.17	38.7	30.39	.08	39.4	12.62	.04	49.4	52.58	.02	43.7
28.0	22.62	.06	61.0	6.90	.07	35.7	30.31	.04	36.4	12.66	.07	48.3	52.60	.04	42.4
Aug. 7.0	22.68	.09	61.6	6.83	.03	32.5	30.29	.02	33.4	12.73	.10	47.1	52.64	.07	41.2
17.0	22.77	.12	62.1	6.86	.14	29.3	30.33	.11	30.3	12.83	.14	45.7	52.71	.10	40.1
27.0	22.89	.14	62.5	7.00	.24	26.2	30.44	.18	27.3	12.97	.17	44.2	52.81	.13	39.1
Sept. 5.9	23.03	.17	62.7	7.24	.33	23.3	30.62	.25	24.5	13.14	.20	42.7	52.94	.15	38.3
15.9	23.20	.20	62.6	7.57	.43	20.6	30.87	.31	22.0	13.34	.24	41.0	53.09	.19	37.8
25.9	23.40	.23	62.3	8.00	.52	18.3	31.18	.36	19.9	13.58	.27	39.3	53.28	.22	37.6
Oct. 5.9	23.63	.26	61.7	8.52	.58	16.5	31.54	.42	18.3	13.85	.30	37.5	53.50	.25	37.7
15.8	23.89	.27	60.9	9.10	.64	15.2	31.96	.45	17.3	14.15	.32	35.8	53.75	.27	38.2
25.8	24.16	.30	59.8	9.74	.67	14.6	32.41	.48	16.9	14.47	.35	34.1	54.02	.29	39.0
Nov. 4.8	24.46	.30	58.5	10.41	.69	14.6	32.89	.50	17.1	14.82	.37	32.5	54.31	.30	40.2
14.7	24.76	.31	56.9	11.10	.67	15.3	33.39	.49	17.9	15.19	.37	31.0	54.61	.31	41.7
24.7	25.07	.31	55.2	11.77	.63	16.7	33.88	.47	19.4	15.56	.37	29.7	54.92	.31	43.5
Dec. 4.7	25.38	.30	53.4	12.40	.58	18.7	34.35	.44	21.5	15.93	.35	28.7	55.23	.30	45.5
14.7	25.68	.27	51.5	12.98	.51	21.2	34.79	.38	24.1	16.28	.34	27.9	55.53	.28	47.6
24.6	25.95	.24	49.7	13.49	.41	24.2	35.17	.32	27.1	16.62	.30	27.4	55.81	.24	49.8
34.6	26.19		48.0	13.90		27.5	35.49		30.5	16.92		27.2	56.05		52.1

# FIXED STARS, 1904.

353

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	1 Draconis (H.).		4 Ursæ Majoris.		θ Ursæ Majoris.		10 Leonis Minoris.		α Leonis.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	h m	° '	h m	° '	h m	° '	h m	° '	h m	° '
	9 23	+81 44	9 25	+70 14	9 26	+52 6	9 28	+36 48	9 36	+10 19
	s	"	s	"	s	"	s	"	s	"
Jan. 0.6	30.54	44.4	62.02	49.6	27.53	36.6	21.64	70.9	2.63	35.8
10.6	31.75	46.5	62.59	51.2	27.88	37.4	21.93	70.9	2.88	34.4
20.6	32.72	49.0	63.06	53.3	28.16	38.6	22.17	71.3	3.08	33.2
30.5	33.40	51.8	63.40	55.7	28.38	40.1	22.35	72.0	3.24	32.3
Feb. 9.5	33.78	54.8	63.61	58.3	28.52	41.9	22.47	73.0	3.35	31.6
19.5	33.86	57.9	63.68	61.1	28.58	44.0	22.53	74.2	3.40	31.2
29.5	33.62	61.0	63.61	63.9	28.56	46.1	22.53	75.6	3.41	31.0
Mar. 10.4	33.10	63.9	63.42	66.6	28.47	48.2	22.47	77.0	3.37	31.0
20.4	32.32	66.5	63.12	69.1	28.32	50.2	22.37	78.5	3.30	31.2
30.4	31.32	68.8	62.73	71.3	28.12	52.0	22.23	79.9	3.19	31.6
Apr. 9.4	30.14	70.6	62.26	73.1	27.88	53.6	22.06	81.1	3.06	32.0
19.3	28.85	71.9	61.75	74.5	27.62	54.8	21.87	82.2	2.92	32.5
29.3	27.49	72.7	61.21	75.4	27.35	55.7	21.68	83.1	2.78	33.1
May 9.3	26.12	72.8	60.67	75.7	27.08	56.3	21.49	83.7	2.63	33.6
19.2	24.79	72.5	60.14	75.6	26.82	56.5	21.31	84.1	2.49	34.2
29.2	23.54	71.5	59.66	75.0	26.59	56.2	21.15	84.3	2.37	34.8
June 8.2	22.41	70.1	59.23	73.9	26.38	55.6	21.01	84.1	2.27	35.4
18.2	21.43	68.2	58.86	72.3	26.21	54.7	20.90	83.7	2.18	35.9
28.1	20.63	65.9	58.57	70.4	26.09	53.4	20.82	83.1	2.12	36.4
July 8.1	20.04	63.2	58.36	68.1	26.01	51.9	20.77	82.3	2.08	36.8
18.1	19.66	60.3	58.24	65.6	25.97	50.1	20.76	81.3	2.06	37.1
28.1	19.50	57.1	58.21	62.8	25.98	48.1	20.78	80.1	2.07	37.4
Aug. 7.0	19.57	53.8	58.27	59.9	26.04	45.9	20.83	78.7	2.11	37.6
17.0	19.87	50.5	58.42	56.8	26.14	43.6	20.92	77.2	2.18	37.6
27.0	20.39	47.1	58.67	53.8	26.30	41.2	21.05	75.6	2.27	37.5
Sept. 5.9	21.13	43.8	59.00	50.7	26.50	38.7	21.21	73.9	2.40	37.2
15.9	22.07	40.6	59.42	47.7	26.74	36.3	21.40	72.1	2.55	36.7
25.9	23.20	37.7	59.92	44.9	27.03	33.9	21.63	70.2	2.73	36.0
Oct. 5.9	24.50	35.0	60.49	42.3	27.36	31.5	21.89	68.3	2.94	35.0
15.8	25.96	32.7	61.14	39.9	27.73	29.3	22.19	66.4	3.18	33.9
25.8	27.55	30.7	61.84	37.9	28.14	27.3	22.52	64.5	3.45	32.6
Nov. 4.8	29.23	29.2	62.59	36.2	28.58	25.6	22.87	62.8	3.74	31.0
14.8	30.97	28.2	63.37	35.0	29.04	24.1	23.24	61.2	4.05	29.4
24.7	32.73	27.8	64.16	34.3	29.51	23.0	23.62	59.8	4.37	27.7
Dec. 4.7	34.47	27.9	64.95	34.1	29.98	22.3	24.00	58.7	4.69	25.9
14.7	36.13	28.6	65.71	34.4	30.43	22.0	24.37	57.8	5.00	24.2
24.6	37.66	29.9	66.42	35.3	30.86	22.1	24.72	57.3	5.30	22.6
34.6	39.02	31.7	67.06	36.6	31.25	22.7	25.03	57.1	5.57	21.1

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Chamæleontis.		ε Leonis.		δ Leonis.		19 Leonis Minoris.		π Leonis.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 9 36	° —80 30	h m 9 40	° +24 12	h m 9 47	° +26 27	h m 9 51	° +41 30	h m 9 55	° + 8 29
Jan. 0.6	52.58 s	27.8 "	25.09 s	46.1 "	19.13 s	19.9 "	49.24 s	30.3 "	9.33 s	69.0 "
10.6	53.34 0.76	31.1 3.3	25.36 .27	45.4 0.7	19.40 .27	19.3 0.6	49.56 .32	30.4 0.1	9.59 .26	67.5 1.5
20.6	53.87 0.53	34.7 3.6	25.58 .22	45.0 0.4	19.64 .24	19.0 0.3	49.83 .27	30.9 0.5	9.81 .22	66.2 1.3
30.6	54.17 0.30	38.4 3.7	25.76 .18	44.9 0.1	19.82 .18	19.0 0.0	50.05 .22	31.7 0.8	9.98 .17	65.1 1.1
Feb. 9.5	54.23 0.06	42.3 3.9	25.88 .12	44.9 0.2	19.95 .13	19.3 0.3	50.21 .16	32.9 1.2	10.11 .13	64.3 0.8
	54.23 0.17	42.3 3.8	25.88 .07	45.1 0.4	19.95 .08	19.3 0.6	50.21 .09	32.9 1.5	10.11 .07	64.3 0.6
19.5	54.06 0.40	46.1 3.7	25.95 .01	45.5 0.7	20.03 .02	19.9 0.8	50.30 .03	34.4 1.6	10.18 .03	63.7 0.3
29.5	53.66 0.60	49.8 3.5	25.96 .04	46.2 0.8	20.05 .03	20.7 0.9	50.33 .04	36.0 1.7	10.21 .02	63.4 0.1
Mar. 10.4	53.06 0.78	53.3 3.2	25.92 .07	47.0 0.9	20.02 .07	21.6 1.0	50.29 .09	37.7 1.7	10.19 .06	63.3 0.1
20.4	52.28 0.94	56.5 2.9	25.85 .11	47.9 0.9	19.95 .11	22.6 1.1	50.20 .13	39.4 1.7	10.13 .09	63.4 0.3
30.4	51.34 1.07	59.4 2.5	25.74 .14	48.8 1.0	19.84 .13	23.7 1.1	50.07 .16	41.1 1.6	10.04 .11	63.7 0.4
Apr. 9.4	50.27 1.17	61.9 2.1	25.60 .15	49.8 0.9	19.71 .16	24.8 0.9	49.91 .19	42.7 1.3	9.93 .13	64.1 0.5
19.3	49.10 1.24	64.0 1.5	25.45 .16	50.7 0.8	19.55 .16	25.7 0.9	49.72 .20	44.0 1.1	9.80 .14	64.6 0.5
29.3	47.86 1.29	65.5 1.0	25.29 .16	51.5 0.7	19.39 .16	26.6 0.8	49.52 .21	45.1 0.9	9.66 .14	65.1 0.6
May 9.3	46.57 1.30	66.5 0.5	25.13 .15	52.2 0.6	19.23 .16	27.4 0.6	49.31 .20	46.0 0.5	9.52 .13	65.7 0.6
19.3	45.27 1.28	67.0 0.0	24.98 .14	52.8 0.4	19.07 .14	28.0 0.4	49.11 .18	46.5 0.2	9.39 .13	66.3 0.6
29.2	43.99 1.24	67.0 0.6	24.84 .12	53.2 0.2	18.93 .12	28.4 0.2	48.93 .16	46.7 0.0	9.26 .11	66.9 0.6
June 8.2	42.75 1.16	66.4 1.1	24.72 .09	53.4 0.1	18.81 .11	28.6 0.1	48.77 .14	46.7 0.4	9.15 .09	67.5 0.6
18.2	41.59 1.05	65.3 1.6	24.63 .08	53.5 0.0	18.70 .08	28.7 0.1	48.63 .11	46.3 0.7	9.06 .08	68.1 0.6
28.1	40.54 0.92	63.7 2.0	24.55 .04	53.5 0.2	18.62 .05	28.6 0.3	48.52 .08	45.6 1.0	8.98 .05	68.7 0.5
July 8.1	39.62 0.76	61.7 2.5	24.51 .02	53.3 0.4	18.57 .03	28.3 0.5	48.44 .05	44.6 1.2	8.93 .03	69.2 0.4
18.1	38.86 0.57	59.2 2.8	24.49 .01	52.9 0.5	18.54 .00	27.8 0.6	48.39 .01	43.4 1.4	8.90 .00	69.6 0.3
28.1	38.29 0.37	56.4 3.0	24.50 .04	52.4 0.6	18.54 .04	27.2 0.8	48.38 .03	42.0 1.6	8.90 .02	69.9 0.3
Aug. 7.0	37.92 0.15	53.4 3.1	24.54 .06	51.8 0.8	18.58 .06	26.4 1.0	48.41 .06	40.4 1.8	8.92 .04	70.2 0.1
17.0	37.77 0.08	50.3 3.2	24.60 .10	51.0 1.0	18.64 .09	25.4 1.1	48.47 .10	38.6 1.9	8.96 .08	70.3 0.1
27.0	37.85 0.31	47.1 3.1	24.70 .13	50.0 1.1	18.73 .12	24.3 1.2	48.57 .14	36.7 2.1	9.04 .10	70.2 0.2
Sept. 6.0	38.16 0.54	44.0 2.9	24.83 .16	48.9 1.3	18.85 .16	23.1 1.4	48.71 .17	34.6 2.1	9.14 .13	70.0 0.5
15.9	38.70 0.75	41.1 2.6	24.99 .20	47.6 1.4	19.01 .19	21.7 1.5	48.88 .22	32.5 2.2	9.27 .17	69.5 0.6
25.9	39.45 0.96	38.5 2.2	25.19 .22	46.2 1.5	19.20 .22	20.2 1.7	49.10 .25	30.3 2.3	9.44 .20	68.9 0.9
Oct. 5.9	40.41 1.11	36.3 1.7	25.41 .26	44.7 1.6	19.42 .25	18.5 1.7	49.35 .29	28.0 2.2	9.64 .22	68.0 1.1
15.8	41.52 1.25	34.6 1.2	25.67 .28	43.1 1.7	19.67 .29	16.8 1.8	49.64 .33	25.8 2.1	9.86 .26	66.9 1.3
25.8	42.77 1.34	33.4 0.5	25.95 .31	41.4 1.7	19.96 .31	15.0 1.8	49.97 .36	23.7 2.0	10.12 .28	65.6 1.6
Nov. 4.8	44.11 1.38	32.9 0.2	26.26 .33	39.7 1.7	20.27 .33	13.2 1.8	50.33 .38	21.7 1.8	10.40 .30	64.0 1.7
14.8	45.49 1.37	33.1 0.8	26.59 .34	38.0 1.7	20.60 .34	11.4 1.7	50.71 .40	19.9 1.6	10.70 .32	62.3 1.8
24.7	46.86 1.31	33.9 1.5	26.93 .34	36.3 1.5	20.94 .35	9.7 1.5	51.11 .40	18.3 1.2	11.02 .32	60.5 1.8
Dec. 4.7	48.17 1.21	35.4 2.0	27.27 .34	34.8 1.3	21.29 .35	8.2 1.3	51.51 .40	17.1 0.9	11.34 .32	58.7 1.8
14.7	49.38 1.06	37.4 2.6	27.61 .32	33.5 1.2	21.64 .32	6.9 1.1	51.91 .38	16.2 0.6	11.66 .30	56.9 1.8
24.7	50.44 0.87	40.0 3.1	27.93 .29	32.3 0.8	21.96 .30	5.8 0.8	52.29 .35	15.6 0.1	11.96 .28	55.1 1.6
34.6	51.31	43.1	28.22	31.5	22.26	5.0	52.64	15.5	12.24	53.5

# FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

355

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Leonis. (Regulus.)		32 Ursæ Majoris.		7 Ursæ Majoris.		$\gamma^1$ Leonis.		$\mu$ Hydræ.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.
	h m 10 3	° ' " +12 25	h m 10 11	° ' " +65 34	h m 10 11	° ' " +43 23	h m 10 14	° ' " +20 19	h m 10 21	° ' " -16 20
Jan. 0.7	16.42	61.8	4.99	54.6	19.28	21.4	41.56	26.7	27.84	46.6
10.6	16.69	60.4	5.54	55.5	19.63	21.4	41.84	25.6	28.11	49.1
20.6	16.92	59.3	6.01	57.0	19.93	21.8	42.09	24.8	28.34	51.6
30.6	17.10	58.4	6.39	58.9	20.18	22.7	42.29	24.4	28.53	54.0
Feb. 9.5	17.24	57.8	6.67	61.2	20.36	23.9	42.44	24.2	28.67	56.2
19.5	17.33	57.5	6.84	63.7	20.48	25.4	42.55	24.3	28.76	58.3
29.5	17.36	57.4	6.90	66.4	20.53	27.1	42.60	24.7	28.81	60.1
Mar. 10.5	17.35	57.6	6.85	69.1	20.52	28.9	42.60	25.3	28.81	61.7
20.4	17.30	57.9	6.71	71.8	20.45	30.8	42.55	26.1	28.77	63.0
30.4	17.22	58.4	6.47	74.3	20.34	32.7	42.48	27.0	28.69	64.1
Apr. 9.4	17.11	58.9	6.17	76.5	20.19	34.4	42.38	27.9	28.59	64.9
19.4	16.98	59.5	5.81	78.3	20.00	36.0	42.25	28.8	28.47	65.4
29.3	16.84	60.2	5.41	79.7	19.80	37.3	42.11	29.7	28.34	65.6
May 9.3	16.70	60.9	4.99	80.7	19.60	38.3	41.97	30.5	28.20	65.6
19.3	16.56	61.5	4.57	81.2	19.39	39.0	41.83	31.2	28.06	65.3
29.2	16.44	62.1	4.17	81.2	19.20	39.3	41.69	31.8	27.93	64.7
June 8.2	16.32	62.7	3.79	80.7	19.02	39.4	41.57	32.3	27.80	64.0
18.2	16.22	63.2	3.45	79.8	18.86	39.1	41.46	32.6	27.68	63.1
28.2	16.14	63.6	3.15	78.4	18.73	38.4	41.37	32.8	27.58	62.0
July 8.1	16.09	63.9	2.91	76.6	18.62	37.5	41.30	32.8	27.50	60.7
18.1	16.05	64.2	2.73	74.5	18.55	36.3	41.26	32.7	27.43	59.3
28.1	16.04	64.3	2.62	72.0	18.52	34.8	41.24	32.4	27.39	57.9
Aug. 7.1	16.05	64.3	2.58	69.3	18.52	33.1	41.24	32.0	27.37	56.4
17.0	16.09	64.2	2.60	66.4	18.55	31.2	41.27	31.4	27.38	55.0
27.0	16.16	63.9	2.70	63.4	18.62	29.2	41.33	30.6	27.42	53.7
Sept. 6.0	16.26	63.4	2.87	60.3	18.74	27.0	41.42	29.6	27.49	52.5
15.9	16.38	62.7	3.11	57.1	18.89	24.6	41.55	28.5	27.59	51.6
25.9	16.54	61.9	3.42	54.0	19.09	22.2	41.70	27.1	27.73	50.9
Oct. 5.9	16.74	60.8	3.81	51.0	19.32	19.8	41.89	25.6	27.91	50.6
15.9	16.96	59.5	4.26	48.2	19.60	17.4	42.12	24.0	28.12	50.6
25.8	17.21	58.0	4.77	45.7	19.92	15.1	42.37	22.2	28.36	51.0
Nov. 4.8	17.49	56.4	5.34	43.4	20.27	12.9	42.66	20.4	28.64	51.8
14.8	17.80	54.6	5.96	41.5	20.65	10.9	42.97	18.5	28.94	53.0
24.8	18.12	52.8	6.60	40.0	21.06	9.1	43.30	16.6	29.25	54.6
Dec. 4.7	18.44	51.0	7.27	39.0	21.47	7.7	43.64	14.8	29.58	56.5
14.7	18.77	49.2	7.93	38.6	21.88	6.6	43.97	13.1	29.90	58.7
24.7	19.07	47.5	8.56	38.7	22.28	5.9	44.30	11.6	30.21	61.0
34.6	19.36	46.0	9.15	39.3	22.65	5.7	44.60	10.4	30.50	63.5

# FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\beta$ Leonis Minoris.		$\alpha$ Antliae.		$\gamma$ Draconis (H.).		$\rho$ Leonis.		$\delta$ Leonis Minoris.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 10 22	° ' " +37 11	h m 10 22	° ' " -30 34	h m 10 26	° ' " +76 11	h m 10 27	° ' " +9 47	h m 10 38	° ' " +23 40
	s	"	s	"	s	"	s	"	s	"
Jan. 0.7	20.68	41.5	46.74	41.5	57.86	66.5	46.13	54.4	12.41	75.9
10.6	21.01	41.2	47.02	44.3	58.78	67.6	46.41	52.8	12.71	74.9
20.6	21.30	41.2	47.26	47.3	59.58	69.3	46.66	51.5	12.98	74.2
30.6	21.54	41.7	47.46	50.2	60.24	71.5	46.86	50.4	13.21	73.8
Feb. 9.6	21.72	42.5	47.60	53.1	60.73	74.1	47.02	49.6	13.39	73.7
19.5	21.84	43.6	47.69	55.9	61.05	76.9	47.13	49.1	13.52	74.0
29.5	21.91	45.0	47.73	58.5	61.18	79.9	47.19	48.8	13.60	74.6
Mar. 10.5	21.92	46.5	47.72	60.9	61.12	82.9	47.20	48.7	13.62	75.4
20.4	21.87	48.2	47.67	62.9	60.89	85.9	47.17	48.9	13.60	76.4
30.4	21.78	49.8	47.58	64.7	60.51	88.6	47.11	49.3	13.54	77.5
Apr. 9.4	21.66	51.4	47.46	66.1	59.99	91.1	47.02	49.8	13.45	78.6
19.4	21.50	52.9	47.32	67.2	59.36	93.1	46.91	50.4	13.34	79.8
29.3	21.33	54.2	47.17	67.9	58.65	94.7	46.79	51.0	13.21	80.9
May 9.3	21.15	55.3	47.01	68.3	57.89	95.8	46.66	51.7	13.07	81.9
19.3	20.97	56.1	46.84	68.3	57.11	96.4	46.53	52.4	12.92	82.7
29.3	20.80	56.6	46.68	68.0	56.34	96.4	46.41	53.0	12.78	83.4
June 8.2	20.64	56.8	46.52	67.3	55.60	95.8	46.29	53.6	12.65	84.0
18.2	20.50	56.8	46.38	66.3	54.91	94.7	46.19	54.2	12.53	84.3
28.2	20.38	56.4	46.25	65.0	54.30	93.2	46.10	54.7	12.43	84.5
July 8.1	20.28	55.8	46.14	63.4	53.77	91.2	46.02	55.2	12.34	84.4
18.1	20.21	54.9	46.05	61.7	53.35	88.8	45.97	55.6	12.28	84.2
28.1	20.17	53.8	45.99	59.8	53.04	86.1	45.94	55.8	12.23	83.8
Aug. 7.1	20.16	52.4	45.95	57.7	52.85	83.1	45.93	55.9	12.21	83.2
17.0	20.18	50.9	45.94	55.7	52.78	79.8	45.95	55.9	12.22	82.4
27.0	20.24	49.1	45.97	53.7	52.83	76.5	45.99	55.8	12.25	81.4
Sept. 6.0	20.33	47.2	46.04	51.8	53.02	73.0	46.06	55.4	12.32	80.2
16.0	20.46	45.1	46.14	50.1	53.34	69.6	46.16	54.9	12.42	78.8
25.9	20.63	42.9	46.28	48.7	53.79	66.2	46.30	54.1	12.55	77.2
Oct. 5.9	20.84	40.7	46.47	47.6	54.36	62.9	46.47	53.1	12.72	75.5
15.9	21.08	38.4	46.70	47.0	55.05	59.8	46.67	51.8	12.93	73.6
25.8	21.37	36.1	46.96	46.9	55.85	57.0	46.91	50.4	13.17	71.6
Nov. 4.8	21.69	33.9	47.26	47.2	56.75	54.6	47.18	48.7	13.44	69.6
14.8	22.04	31.8	47.58	48.0	57.72	52.6	47.47	46.9	13.75	67.5
24.8	22.41	29.9	47.93	49.3	58.76	51.1	47.78	45.0	14.08	65.5
Dec. 4.7	22.79	28.2	48.27	51.1	59.83	50.1	48.10	43.1	14.42	63.6
14.7	23.17	26.9	48.62	53.3	60.90	49.7	48.43	41.2	14.76	61.8
24.7	23.55	25.9	48.95	55.8	61.95	49.9	48.74	39.4	15.10	60.3
34.7	23.90	25.3	49.25	58.5	62.93	50.7	49.04	37.7	15.42	59.1



# FIXED STARS, 1904.

357

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	η Argūs.			γ Leonis.			δ Chamæleonis.			46 Leonis Minoris.			Groombridge 1706.		
	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.
	h m	s	°	h m	s	°	h m	s	°	h m	s	°	h m	s	°
	10 41		-59 10	10 44		+11 2	10 44		-80 1	10 47		+34 43	10 52		+78 16
Jan. 0.7	22.42		35.9	13.33		63.4	60.41		47.8	57.11		42.5	17.49		43.0
10.6	22.84	.42	38.9	13.62	.29	61.8	61.46	1.05	50.5	57.45	.34	41.8	18.60	1.11	43.9
20.6	23.20	.36	42.2	13.88	.26	60.4	62.34	0.88	53.6	57.75	.30	41.5	19.59	0.99	45.4
30.6	23.49	.29	45.7	14.10	.22	59.4	63.02	0.68	57.1	58.01	.26	41.7	20.44	0.85	47.4
Feb. 9.6	23.70	.21	49.3	14.27	.17	58.6	63.50	0.48	60.8	58.21	.20	42.2	21.11	0.67	49.8
		.13			.13			0.27	3.8		.15			0.47	
19.5	23.83	.05	53.0	14.40	.07	58.1	63.77	0.06	64.6	58.36	.10	43.1	21.58	0.26	52.6
29.5	23.88	.02	56.7	14.47	.03	57.9	63.83	0.15	68.5	58.46	.04	44.3	21.84	0.04	55.6
Mar. 10.5	23.86	.09	60.2	14.50	.01	57.9	63.68	0.34	72.3	58.50	.02	45.7	21.88	0.16	58.7
20.5	23.77	.15	63.4	14.49	.04	58.1	63.34	0.52	76.0	58.48	.06	47.3	21.72	0.35	61.7
30.4	23.62	.20	66.4	14.45	.08	58.6	62.82	0.68	79.4	58.42	.09	48.9	21.37	0.53	64.6
Apr. 9.4	23.42	.24	69.0	14.37	.10	59.2	62.14	0.82	82.6	58.33	.13	50.6	20.84	0.67	67.3
19.4	23.18	.28	71.3	14.27	.11	59.8	61.32	0.93	85.4	58.20	.15	52.1	20.17	0.79	69.6
29.3	22.90	.31	73.2	14.16	.13	60.5	60.39	1.03	87.8	58.05	.16	53.5	19.38	0.87	71.5
May 9.3	22.59	.32	74.6	14.03	.12	61.3	59.36	1.10	89.8	57.89	.16	54.7	18.51	0.91	72.9
19.3	22.27	.33	75.4	13.91	.13	62.0	58.26	1.15	91.2	57.73	.16	55.7	17.60	0.92	73.7
29.3	21.94	.33	75.8	13.78	.12	62.7	57.11	1.16	92.1	57.57	.16	56.5	16.68	0.91	74.0
June 8.2	21.61	.32	75.7	13.66	.11	63.4	55.95	1.15	92.5	57.41	.15	56.9	15.77	0.87	73.7
18.2	21.29	.30	75.1	13.55	.09	64.0	54.80	1.11	92.3	57.26	.12	57.1	14.90	0.80	72.9
28.2	20.99	.28	74.0	13.46	.08	64.5	53.69	1.04	91.6	57.14	.11	57.0	14.10	0.71	71.6
July 8.2	20.71	.25	72.5	13.38	.07	64.9	52.65	0.94	90.3	57.03	.09	56.6	13.39	0.61	69.8
18.1	20.46	.21	70.6	13.31	.04	65.2	51.71	0.81	88.6	56.94	.06	55.9	12.78	0.49	67.5
28.1	20.25	.16	68.3	13.27	.03	65.4	50.90	0.65	86.4	56.88	.04	55.0	12.29	0.36	64.9
Aug. 7.1	20.09	.10	65.7	13.24	.00	65.4	50.25	0.48	83.8	56.84	.01	53.8	11.93	0.22	62.0
17.0	19.99	.04	62.9	13.24	.03	65.3	49.77	0.27	81.0	56.83	.03	52.4	11.71	0.07	58.8
27.0	19.95	.03	60.0	13.27	.05	65.1	49.50	0.06	77.9	56.86	.06	50.8	11.64	0.08	55.4
Sept. 6.0	19.98	.10	57.1	13.32	.09	64.6	49.44	0.17	74.8	56.92	.09	48.9	11.72	0.23	51.8
16.0	20.08	.17	54.3	13.41	.12	64.0	49.61	0.39	71.7	57.01	.13	46.9	11.95	0.38	48.2
25.9	20.25	.25	51.8	13.53	.16	63.1	50.00	0.62	68.7	57.14	.18	44.8	12.33	0.54	44.7
Oct. 5.9	20.50	.31	49.5	13.69	.19	62.0	50.62	0.82	65.9	57.32	.21	42.5	12.87	0.69	41.2
15.9	20.81	.38	47.6	13.88	.22	60.6	51.44	1.00	63.5	57.53	.26	40.1	13.56	0.83	37.9
25.9	21.19	.44	46.3	14.10	.26	59.1	52.44	1.15	61.6	57.79	.29	37.7	14.39	0.95	34.9
Nov. 4.8	21.63	.48	45.5	14.36	.29	57.4	53.59	1.26	60.3	58.08	.32	35.4	15.34	1.06	32.1
14.8	22.11	.51	45.3	14.65	.31	55.6	54.85	1.32	59.5	58.40	.35	33.1	16.40	1.16	29.8
24.8	22.62	.52	45.8	14.96	.32	53.6	56.17	1.35	59.4	58.75	.37	30.9	17.56	1.21	28.0
Dec. 4.7	23.14	.51	46.9	15.28	.33	51.6	57.52	1.31	60.0	59.12	.38	29.0	18.77	1.23	26.7
14.7	23.65	.49	48.6	15.61	.32	49.7	58.83	1.24	61.2	59.50	.37	27.4	20.00	1.22	26.0
24.7	24.14	.44	50.8	15.93	.30	47.8	60.07	1.13	63.0	59.87	.36	26.1	21.22	1.17	25.9
34.7	24.58		53.4	16.23		46.1	61.20		65.4	60.23		25.2	22.39		26.4

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Ursæ Majoris.		$\eta$ Octantis.		$\rho^3$ Leonis.		$\psi$ Ursæ Majoris.		$\delta$ Leonis.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 10 57	° +62 15	h m 10 59	° -84 4	h m 11 2	° +2 28	h m 11 4	° +45 0	h m 11 9	° +21 2
	s "	"	s "	"	s "	"	s "	"	s "	"
Jan. 0.7	48.68	49.7	71.13	23.3	1.02	31.7	16.38	53.3	0.63	48.5
10.7	49.23	50.0	72.91	25.8	1.31	29.8	16.77	52.8	0.94	47.1
20.6	49.72	50.9	74.44	28.7	1.57	28.0	17.12	52.9	1.23	46.1
30.6	50.14	52.3	75.67	32.0	1.80	26.5	17.43	53.5	1.48	45.5
Feb. 9.6	50.47	54.1	76.57	35.6	1.98	25.2	17.68	54.5	1.68	45.2
19.5	50.72	56.3	77.13	39.3	2.12	24.1	17.87	55.9	1.84	45.2
29.5	50.88	58.8	77.35	43.2	2.21	23.3	17.99	57.6	1.95	45.5
Mar. 10.5	50.93	61.5	77.23	47.0	2.26	22.8	18.05	59.5	2.01	46.2
20.5	50.90	64.2	76.78	50.8	2.26	22.6	18.05	61.6	2.02	47.0
30.4	50.78	66.9	76.03	54.4	2.23	22.5	18.00	63.7	2.00	48.0
Apr. 9.4	50.59	69.4	75.00	57.7	2.17	22.7	17.90	65.8	1.94	49.1
19.4	50.33	71.6	73.72	60.8	2.09	23.0	17.76	67.8	1.85	50.3
29.4	50.03	73.5	72.21	63.4	1.99	23.4	17.59	69.6	1.74	51.4
May 9.3	49.70	75.1	70.53	65.6	1.88	23.9	17.40	71.0	1.62	52.5
19.3	49.35	76.2	68.70	67.4	1.76	24.5	17.20	72.2	1.49	53.5
29.3	49.00	76.8	66.77	68.6	1.64	25.2	17.00	73.1	1.36	54.3
June 8.2	48.65	76.9	64.79	69.3	1.52	25.9	16.80	73.6	1.23	55.0
18.2	48.32	76.5	62.80	69.4	1.41	26.6	16.61	73.7	1.11	55.5
28.2	48.02	75.7	60.85	68.9	1.31	27.3	16.44	73.4	1.00	55.9
July 8.2	47.75	74.5	59.00	67.9	1.22	27.9	16.29	72.7	0.90	56.1
18.1	47.52	72.8	57.30	66.4	1.15	28.6	16.16	71.8	0.81	56.0
28.1	47.34	70.7	55.79	64.5	1.09	29.1	16.06	70.4	0.75	55.8
Aug. 7.1	47.21	68.3	54.54	62.1	1.05	29.6	15.98	68.8	0.70	55.3
17.1	47.14	65.7	53.58	59.4	1.03	30.0	15.94	66.9	0.68	54.7
27.0	47.13	62.8	52.95	56.4	1.04	30.2	15.94	64.8	0.68	53.8
Sept. 6.0	47.18	59.7	52.68	53.2	1.07	30.2	15.98	62.4	0.71	52.8
16.0	47.29	56.5	52.79	50.1	1.13	30.0	16.06	59.9	0.77	51.5
25.9	47.47	53.2	53.29	47.0	1.23	29.6	16.19	57.2	0.87	50.0
Oct. 5.9	47.72	50.0	54.17	44.1	1.37	29.0	16.36	54.5	1.01	48.3
15.9	48.04	46.8	55.40	41.6	1.54	28.1	16.58	51.7	1.18	46.5
25.9	48.43	43.7	56.95	39.4	1.75	26.9	16.84	48.9	1.40	44.5
Nov. 4.8	48.87	40.9	58.76	37.8	1.99	25.5	17.15	46.2	1.65	42.4
14.8	49.37	38.4	60.78	36.8	2.27	23.8	17.51	43.7	1.93	40.2
24.8	49.92	36.3	62.92	36.4	2.57	22.0	17.89	41.4	2.24	38.0
Dec. 4.8	50.50	34.6	65.12	36.6	2.88	20.0	18.30	39.4	2.57	35.9
14.7	51.09	33.5	67.29	37.5	3.21	17.9	18.72	37.8	2.91	33.9
24.7	51.68	32.8	69.36	39.1	3.52	15.9	19.14	36.6	3.25	32.1
34.7	52.25	32.8	71.26	41.2	3.83	13.9	19.55	35.9	3.58	30.6

# FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

359

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	♌ Ursæ Majoris.			♋ Crateris.			♌ Leonis.			♌ Draconis.			♋ Hydræ.		
	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion South.
	h m 11 13	s +33 36	° ' "	h m 11 14	s -14 15	° ' "	h m 11 23	s + 3 22	° ' "	h m 11 25	s +69 51	° ' "	h m 11 28	s -31 19	° ' "
Jan. 0.7	17.96	.35	51.6	33.12	.30	31.1	0.48	.30	61.7	.72	42.29	.72	19.0	.33	27.9
10.7	18.31	.32	50.7	33.42	.27	33.4	0.78	.28	59.8	.67	43.01	.67	19.2	.30	30.4
20.7	18.63	.27	50.2	33.69	.23	35.8	1.06	.24	58.0	.59	43.68	.59	20.0	.26	33.1
30.6	18.90	.23	50.2	33.92	.19	38.0	1.30	.20	56.5	.50	44.27	.50	21.4	.22	35.9
Feb. 9.6	19.13	.18	50.5	34.11	.15	40.2	1.50	.16	55.2	.39	44.77	.39	23.3	.17	38.7
19.6	19.31	.12	51.3	34.26	.10	42.2	1.66	.12	54.2	.26	45.16	.26	25.6	.12	41.4
29.5	19.43	.07	52.4	34.36	.06	43.9	1.78	.07	53.4	.14	45.42	.14	28.2	.07	44.1
Mar. 10.5	19.50	.02	53.7	34.42	.02	45.4	1.85	.03	52.9	.01	45.56	.01	31.1	.03	46.5
20.5	19.52	.03	55.2	34.44	.02	46.7	1.88	.01	52.7	.10	45.57	.10	34.1	.01	48.8
30.5	19.49	.07	56.9	34.42	.05	47.7	1.87	.04	52.8	.21	45.47	.21	37.0	.05	50.8
Apr. 9.4	19.42	.10	58.6	34.37	.08	48.5	1.83	.07	53.0	.31	45.26	.31	39.8	.08	52.5
19.4	19.32	.13	60.3	34.29	.09	49.0	1.76	.08	53.3	.38	44.95	.38	42.4	.10	53.9
29.4	19.19	.14	61.8	34.20	.11	49.3	1.68	.10	53.8	.44	44.57	.44	44.6	.12	55.0
May 9.4	19.05	.16	63.2	34.09	.12	49.4	1.58	.11	54.4	.48	44.13	.48	46.4	.14	55.8
19.3	18.89	.15	64.4	33.97	.12	49.2	1.47	.11	55.0	.50	43.65	.50	47.8	.14	56.3
29.3	18.74	.16	65.3	33.85	.12	48.8	1.36	.12	55.7	.51	43.15	.51	48.7	.15	56.4
June 8.3	18.58	.15	66.0	33.73	.12	48.3	1.24	.11	56.4	.49	42.64	.49	49.0	.14	56.2
18.2	18.43	.13	66.4	33.61	.11	47.6	1.13	.10	57.1	.47	42.15	.47	48.8	.15	55.7
28.2	18.30	.12	66.5	33.50	.11	46.7	1.03	.10	57.8	.44	41.68	.44	48.1	.14	54.9
July 8.2	18.18	.11	66.3	33.39	.09	45.7	0.93	.09	58.4	.39	41.24	.39	46.9	.13	53.8
18.2	18.07	.09	65.8	33.30	.08	44.6	0.84	.07	59.0	.33	40.85	.33	45.2	.11	52.5
28.1	17.98	.06	65.0	33.22	.06	43.4	0.77	.05	59.6	.27	40.52	.27	43.1	.10	51.0
Aug. 7.1	17.92	.03	63.9	33.16	.03	42.2	0.72	.04	60.0	.20	40.25	.20	40.6	.07	49.3
17.1	17.89	.01	62.6	33.13	.02	41.1	0.68	.02	60.3	.12	40.05	.12	37.8	.04	47.4
27.1	17.88	.03	61.1	33.11	.02	39.9	0.66	.02	60.4	.04	39.93	.04	34.7	.01	45.6
Sept. 6.0	17.91	.06	59.3	33.13	.05	38.9	0.68	.04	60.4	.05	39.89	.05	31.4	.03	43.8
16.0	17.97	.10	57.3	33.18	.09	38.1	0.72	.08	60.1	.15	39.94	.15	27.9	.08	42.1
26.0	18.07	.14	55.2	33.27	.12	37.5	0.80	.12	59.7	.23	40.09	.23	24.4	.12	40.5
Oct. 5.9	18.21	.18	52.9	33.39	.17	37.2	0.92	.15	59.0	.33	40.32	.33	20.9	.16	39.2
15.9	18.39	.23	50.5	33.56	.20	37.2	1.07	.20	58.0	.43	40.65	.43	17.4	.22	38.3
25.9	18.62	.27	48.0	33.76	.24	37.6	1.27	.23	56.8	.52	41.08	.52	14.1	.25	37.8
Nov. 4.9	18.89	.30	45.5	34.00	.28	38.3	1.50	.26	55.3	.59	41.60	.59	11.0	.30	37.7
14.8	19.19	.34	43.0	34.28	.30	39.4	1.76	.29	53.6	.66	42.19	.66	8.2	.33	38.1
24.8	19.53	.36	40.7	34.58	.32	40.8	2.05	.31	51.7	.72	42.85	.72	5.8	.34	38.9
Dec. 4.8	19.89	.37	38.6	34.90	.33	42.6	2.36	.33	49.7	.75	43.57	.75	3.9	.36	40.2
14.7	20.26	.37	36.7	35.23	.33	44.6	2.69	.32	47.6	.76	44.32	.76	2.5	.36	41.9
24.7	20.63	.36	35.2	35.56	.31	46.7	3.01	.31	45.5	.75	45.08	.75	1.7	.34	44.0
34.7	20.99		34.0	35.87		49.0	3.32		43.5		45.83		1.5		46.4

# FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Leonis.		γ Ursæ Majoris.		β Leonis.		γ Ursæ Majoris.		π Virginis.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 11 32	° ' " - 0 17	h m 11 40	° ' " +48 18	h m 11 44	° ' " +15 6	h m 11 48	° ' " +54 13	h m 11 55	° ' " + 7 8
	s	"	s	"	s	"	s	"	s	"
Jan. 0.7	2.44	40.0	58.89	25.3	10.03	23.9	46.74	24.9	57.42	54.3
10.7	2.75	42.0	59.32	24.6	10.35	22.2	47.21	24.3	57.74	52.4
20.7	3.03	43.9	59.71	24.5	10.64	20.8	47.65	24.3	58.03	50.7
30.6	3.27	45.6	60.07	24.9	10.91	19.7	48.06	24.8	58.30	49.2
Feb. 9.6	3.48	47.1	60.37	25.8	11.14	19.0	48.40	25.9	58.53	48.1
19.6	3.65	48.3	60.62	27.1	11.32	18.6	48.69	27.5	58.72	47.2
29.6	3.77	49.3	60.80	28.9	11.46	18.5	48.90	29.5	58.87	46.6
Mar. 10.5	3.85	50.0	60.91	30.9	11.55	18.7	49.04	31.7	58.97	46.4
20.5	3.89	50.4	60.96	33.2	11.60	19.2	49.10	34.2	59.03	46.4
30.5	3.89	50.6	60.95	35.5	11.61	19.9	49.09	36.8	59.06	46.6
Apr. 9.4	3.86	50.6	60.89	37.9	11.59	20.8	49.02	39.4	59.05	47.1
19.4	3.80	50.4	60.78	40.2	11.53	21.8	48.90	41.8	59.01	47.7
29.4	3.72	50.1	60.63	42.3	11.46	22.8	48.73	44.1	58.95	48.4
May 9.4	3.63	49.7	60.45	44.1	11.36	23.8	48.52	46.1	58.87	49.2
19.3	3.52	49.1	60.25	45.7	11.25	24.8	48.29	47.8	58.77	50.0
29.3	3.41	48.5	60.04	46.9	11.14	25.8	48.04	49.0	58.67	50.8
June 8.3	3.30	47.8	59.82	47.7	11.02	26.6	47.79	49.8	58.56	51.6
18.3	3.19	47.1	59.61	48.1	10.90	27.3	47.53	50.2	58.45	52.3
28.2	3.08	46.4	59.40	48.0	10.79	27.9	47.28	50.1	58.34	53.0
July 8.2	2.98	45.7	59.21	47.6	10.68	28.3	47.04	49.6	58.23	53.5
18.2	2.89	45.0	59.03	46.8	10.58	28.6	46.83	48.7	58.13	54.0
28.1	2.81	44.4	58.88	45.6	10.49	28.7	46.63	47.3	58.04	54.4
Aug. 7.1	2.75	43.8	58.76	44.0	10.42	28.6	46.47	45.6	57.96	54.7
17.1	2.71	43.3	58.66	42.1	10.36	28.2	46.34	43.5	57.90	54.8
27.1	2.69	43.0	58.60	39.9	10.33	27.7	46.25	41.0	57.86	54.7
Sept. 6.0	2.69	42.8	58.58	37.4	10.32	27.0	46.21	38.3	57.84	54.5
16.0	2.73	42.8	58.60	34.7	10.34	26.1	46.22	35.4	57.85	54.0
26.0	2.80	43.1	58.67	31.8	10.40	24.9	46.28	32.3	57.90	53.3
Oct. 6.0	2.90	43.6	58.79	28.8	10.49	23.5	46.40	29.1	57.98	52.3
15.9	3.05	44.3	58.97	25.8	10.63	21.9	46.58	25.8	58.10	51.1
25.9	3.23	45.4	59.20	22.7	10.81	20.1	46.82	22.5	58.27	49.7
Nov. 4.9	3.46	46.7	59.48	19.7	11.02	18.1	47.11	19.4	58.47	48.1
14.9	3.72	48.2	59.81	16.8	11.27	15.9	47.47	16.4	58.71	46.2
24.8	4.00	50.0	60.18	14.2	11.56	13.7	47.87	13.7	58.99	44.2
Dec. 4.8	4.31	52.0	60.59	11.9	11.87	11.5	48.32	11.3	59.29	42.1
14.8	4.63	54.0	61.02	9.9	12.20	9.4	48.79	9.3	59.61	39.9
24.7	4.96	56.1	61.46	8.4	12.53	7.3	49.28	7.8	59.94	37.8
34.7	5.27	58.2	61.90	7.4	12.86	5.5	49.76	6.9	60.26	35.8

# FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

361

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Virginis.			ε Corvi.			4 Draconis (H.).			γ Corvi.			2 Canum Venat.		
	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.
	h	m	°	h	m	°	h	m	°	h	m	°	h	m	°
	12	0	+ 9 15	12	5	-22 5	12	7	+78 8	12	10	-17 0	12	11	+41 11
	s		"	s		"	s		"	s		"	s		"
Jan. 0.7	19.33		53.2	11.67		2.9	40.29		38.8	52.46		27.0	18.81		25.9
		.31	1.9		.33	2.3		1.17		.32	2.2			.39	1.2
10.7	19.64		51.3	12.00		5.2	41.46		38.6	52.78		29.2	19.20		24.7
		.30	1.7		.31	2.4		1.13		.31	2.3			.37	0.7
20.7	19.94		49.6	12.31		7.6	42.59		39.1	53.09		31.5	19.57		24.0
		.27	1.3		.28	2.4		1.04		.28	2.3			.34	0.2
30.7	20.21		48.3	12.59		10.0	43.63		40.3	53.37		33.8	19.91		23.8
		.23	1.1		.24	2.3		0.92		1.7	2.1			.30	0.3
Feb. 9.6	20.44		47.2	12.83		12.3	44.55		42.0	53.61		35.9	20.21		24.1
		.20	0.8		.20	2.3		0.76		2.2	2.1			.26	0.9
	19.6		46.4	13.03		14.6	45.31		44.2	53.81		38.0	20.47		25.0
		.15	0.4		.16	2.1		0.58		.16	1.9			.20	1.2
29.6	20.79		46.0	13.19		16.7	45.89		46.9	53.97		39.9	20.67		26.2
		.11	0.2		.12	2.0		0.38		.12	1.6			.14	1.6
Mar. 10.5	20.90		45.8	13.31		18.7	46.27		49.8	54.09		41.5	20.81		27.8
		.07	0.2		.07	1.8		0.19		.08	1.5			.09	1.9
20.5	20.97		46.0	13.38		20.5	46.46		52.9	54.17		43.0	20.90		29.7
		.02	0.4		.03	1.5		0.02		3.1	1.2			.04	2.1
30.5	20.99		46.4	13.41		22.0	46.44		56.0	54.21		44.2	20.94		31.8
		.00	0.5		.00	1.2		0.21		3.1	1.0			.01	2.2
Apr. 9.5	20.99		46.9	13.41		23.2	46.23		59.1	54.21		45.2	20.93		34.0
		.04	0.7		.03	1.0		0.39		.02	0.8			.06	2.2
19.4	20.95		47.6	13.38		24.2	45.84		62.0	54.19		46.0	20.87		36.2
		.06	0.9		.06	0.8		0.55		.05	0.5			.10	2.2
29.4	20.89		48.5	13.32		25.0	45.29		64.6	54.14		46.5	20.77		38.4
		.08	0.8		.07	0.6		0.67		.07	0.3			.12	1.9
May 9.4	20.81		49.3	13.25		25.6	44.62		66.8	54.07		46.8	20.65		40.3
		.09	0.9		.10	0.3		0.78		.08	0.1			.14	1.7
19.4	20.72		50.2	13.15		25.9	43.84		68.6	53.99		46.9	20.51		42.0
		.10	0.9		.10	0.0		0.85		1.2	0.1			.16	1.5
	29.3		51.1	13.05		25.9	42.99		69.8	53.89		46.8	20.35		43.5
		.11	0.8		.12	0.2		0.90		.11	0.3			.18	1.1
June 8.3	20.51		51.9	12.93		25.7	42.09		70.6	53.78		46.5	20.17		44.6
		.11	0.8		.12	0.4		0.92		.11	0.5			.18	0.7
18.3	20.40		52.7	12.81		25.3	41.17		70.7	53.67		46.0	19.99		45.3
		.11	0.7		.13	0.6		0.91		.12	0.6			.18	0.4
28.2	20.29		53.4	12.68		24.7	40.26		70.3	53.55		45.4	19.81		45.7
		.11	0.5		.13	0.9		0.88		.12	0.8			.17	0.0
July 8.2	20.18		53.9	12.55		23.8	39.38		69.4	53.43		44.6	19.64		45.7
		.11	0.5		.12	1.0		0.83		1.4	1.0			.16	0.3
	18.2		54.4	12.43		22.8	38.55		68.0	53.31		43.6	19.48		45.4
		.09	0.3		.11	1.1		0.76		1.9	1.0			.15	0.7
28.2	19.98		54.7	12.32		21.7	37.79		66.1	53.20		42.6	19.33		44.7
		.09	0.2		.11	1.3		0.66		.10	1.1			.14	1.1
Aug. 7.1	19.89		54.9	12.21		20.4	37.13		63.7	53.10		41.5	19.19		43.6
		.06	0.0		.08	1.3		0.56		.09	1.1			.11	1.5
17.1	19.83		54.9	12.13		19.1	36.57		61.0	53.01		40.4	19.08		42.1
		.05	0.2		.07	1.3		0.44		3.1	1.1			.08	1.8
27.1	19.78		54.7	12.06		17.8	36.13		57.9	52.95		39.3	19.00		40.3
		.02	0.4		.03	1.3		0.31		3.4	1.0			.06	2.0
Sept. 6.1	19.76		54.3	12.03		16.5	35.82		54.5	52.91		38.3	18.94		38.3
		.01	0.6		.01	1.2		0.17		.01	0.9			.02	2.3
16.0	19.77		53.7	12.02		15.3	35.65		51.0	52.90		37.4	18.92		36.0
		.04	0.8		.04	1.1		0.01		.03	0.8			.03	2.6
26.0	19.81		52.9	12.06		14.2	35.64		47.3	52.93		36.6	18.95		33.4
		.08	1.1		.07	0.8		0.14		.07	0.5			.07	2.8
Oct. 6.0	19.89		51.8	12.13		13.4	35.78		43.5	53.00		36.1	19.02		30.6
		.11	1.3		.12	0.5		0.30		.11	0.2			.12	2.9
15.9	20.00		50.5	12.25		12.9	36.08		39.8	53.11		35.9	19.14		27.7
		.16	1.6		.17	0.2		0.47		3.7	0.1			.17	3.0
	25.9		48.9	12.42		12.7	36.55		36.1	53.27		36.0	19.31		24.7
		.20	1.7		.21	0.2		0.63		3.4	0.4			.23	3.0
Nov. 4.9	20.36		47.2	12.63		12.9	37.18		32.7	53.47		36.4	19.54		21.7
		.24	1.9		.26	0.5		0.78		.24	0.7			.27	3.0
14.9	20.60		45.3	12.89		13.4	37.96		29.5	53.71		37.3	19.81		18.7
		.28	2.1		.29	1.0		0.92		.28	1.2			.31	2.8
24.8	20.88		43.2	13.18		14.4	38.88		26.8	53.99		38.1	20.12		15.9
		.30	2.2		.31	1.3		1.03		2.3	1.4			.35	2.6
Dec. 4.8	21.18		41.0	13.49		15.7	39.92		24.5	54.30		39.7	20.47		13.3
		.32	2.1		.34	1.7		1.12		1.8	1.7			.38	2.3
	14.8		38.9	13.83		17.4	41.03		22.7	54.63		41.4	20.85		11.0
		.32	2.1		.34	1.9		1.18		1.2	2.0			.40	1.9
24.8	21.82		36.8	14.17		19.3	42.21		21.5	54.96		43.4	21.25		9.1
		.33	2.0		.34	2.2		1.19		0.6	2.2			.40	1.5
34.7	22.15		34.8	14.51		21.5	43.40		20.9	55.29		45.6	21.65		7.6

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\beta$ Chamaeleontis.		6 Ursæ Min. (B.)		$\eta$ Virginis.		$\alpha^1$ Crucis.		$\alpha^2$ Corvi.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.
	h m 12 12	° -78 46	h m 12 13	° +88 13	h m 12 14	° -0 8	h m 12 21	° -62 33	h m 12 24	° -15 58
	s	"	s	"	s	"	s	"	s	"
Jan. 0.7	46.17	25.2	67.0	35.3	59.85	1.0	16.67	43.5	54.07	46.5
10.7	47.37	26.8	74.2	35.3	60.17	3.0	17.24	45.3	54.40	48.7
20.7	48.48	29.0	81.2	36.0	60.47	4.9	17.77	47.6	54.71	50.9
30.7	49.48	31.7	87.8	37.3	60.74	6.7	18.26	50.3	54.99	53.1
Feb. 9.6	50.35	34.7	93.6	39.2	60.98	8.2	18.69	53.4	55.24	55.2
	51.06	38.1	98.4	41.5	61.18	9.5	19.04	56.7	55.46	57.2
19.6	51.60	41.7	102.1	44.3	61.35	10.5	19.32	60.1	55.63	59.0
29.6	51.97	45.4	104.6	47.3	61.47	11.2	19.53	63.6	55.76	60.6
Mar. 10.5	52.18	49.2	105.8	50.5	61.55	11.6	19.67	67.0	55.85	62.0
20.5	52.21	53.0	105.6	53.7	61.59	11.8	19.73	70.4	55.91	63.2
30.5										
Apr. 9.5	52.07	56.6	104.1	56.8	61.60	11.8	19.72	73.6	55.93	64.1
19.4	51.78	60.0	101.4	59.7	61.58	11.6	19.65	76.6	55.92	64.8
29.4	51.35	63.1	97.6	62.3	61.54	11.2	19.52	79.3	55.89	65.3
May 9.4	50.79	65.9	92.8	64.5	61.48	10.7	19.33	81.7	55.83	65.5
19.4	50.11	68.4	87.2	66.2	61.40	10.1	19.10	83.7	55.76	65.6
29.3	49.32	70.4	81.1	67.3	61.31	9.5	18.83	85.3	55.67	65.5
June 8.3	48.45	71.8	74.6	68.0	61.21	8.8	18.53	86.4	55.56	65.2
18.3	47.52	72.8	68.0	68.0	61.10	8.1	18.20	87.1	55.45	64.8
28.2	46.56	73.2	61.3	67.5	60.99	7.4	17.85	87.2	55.34	64.2
July 8.2	45.58	73.1	54.8	66.4	60.88	6.7	17.49	86.9	55.22	63.5
18.2	44.62	72.4	48.6	64.8	60.77	6.1	17.14	86.1	55.10	62.6
28.2	43.71	71.2	43.0	62.7	60.67	5.5	16.80	84.8	54.98	61.7
Aug. 7.1	42.87	69.5	38.0	60.2	60.58	4.9	16.49	83.1	54.87	60.7
17.1	42.14	67.4	33.7	57.3	60.50	4.5	16.21	81.1	54.78	59.7
27.1	41.54	64.9	30.2	54.1	60.44	4.2	15.98	78.7	54.71	58.7
Sept. 6.1	41.10	62.1	27.7	50.6	60.41	4.1	15.81	76.1	54.66	57.7
16.0	40.85	59.0	26.1	46.9	60.40	4.1	15.72	73.3	54.64	56.9
26.0	40.80	55.9	25.5	43.2	60.43	4.4	15.71	70.6	54.65	56.2
Oct. 6.0	40.95	52.9	25.9	39.4	60.49	4.9	15.78	67.9	54.70	55.8
15.9	41.32	50.0	27.5	35.6	60.59	5.7	15.95	65.4	54.80	55.6
25.9	41.89	47.3	30.0	32.0	60.74	6.7	16.21	63.1	54.95	55.7
Nov. 4.9	42.65	45.1	33.6	28.6	60.93	8.0	16.55	61.3	55.14	56.1
14.9	43.58	43.3	38.2	25.5	61.16	9.5	16.97	60.0	55.37	56.9
24.8	44.65	42.1	43.6	22.9	61.42	11.3	17.46	59.2	55.64	58.0
Dec. 4.8	45.81	41.5	49.7	20.7	61.72	13.2	18.01	59.0	55.94	59.4
14.8	47.04	41.5	56.5	19.0	62.03	15.3	18.58	59.3	56.26	61.1
24.8	48.28	42.1	63.7	18.0	62.35	17.4	19.16	60.3	56.59	63.0
34.7	49.50	43.4	71.0	17.6	62.67	19.5	19.74	61.8	56.92	65.1

# FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

363

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\beta$ Canum Venat.		$\beta$ Corvi.		$\kappa$ Draconis.		$\gamma$ Virginis (mean).		$\zeta$ Comæ Berenices.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.
	h m 12 29	° +41 52	h m 12 29	° -22 51	h m 12 29	° +70 18	h m 12 36	° - 0 55	h m 12 47	° +28 3
	s	"	s	"	s	"	s	"	s	"
Jan. 0.7	10.72	30.9	20.90	49.6	21.72	43.8	47.83	22.3	1.02	37.7
10.7	11.11	29.5	21.24	51.8	22.48	43.1	48.15	24.4	1.37	36.0
20.7	11.49	28.7	21.56	54.0	23.21	43.1	48.46	26.3	1.71	34.6
30.7	11.84	28.4	21.85	56.4	23.90	43.8	48.75	28.1	2.03	33.7
Feb. 9.6	12.16	28.6	22.11	58.7	24.52	45.0	49.00	29.6	2.32	33.2
19.6	12.43	29.4	22.34	60.9	25.06	46.8	49.22	30.9	2.58	33.2
29.6	12.65	30.6	22.52	63.0	25.48	49.1	49.40	32.0	2.79	33.7
Mar. 10.6	12.82	32.2	22.66	65.0	25.79	51.8	49.54	32.7	2.95	34.5
20.5	12.93	34.1	22.76	66.8	25.98	54.7	49.64	33.2	3.07	35.7
30.5	12.99	36.2	22.82	68.3	26.05	57.7	49.71	33.5	3.15	37.1
Apr. 9.5	12.99	38.5	22.85	69.6	26.00	60.8	49.74	33.5	3.19	38.8
19.4	12.95	40.8	22.84	70.7	25.84	63.7	49.74	33.3	3.19	40.6
29.4	12.88	43.0	22.81	71.6	25.58	66.5	49.72	33.0	3.15	42.4
May 9.4	12.77	45.1	22.75	72.2	25.24	68.9	49.67	32.5	3.09	44.1
19.4	12.63	47.0	22.68	72.6	24.83	71.0	49.60	31.9	3.00	45.8
29.3	12.47	48.6	22.59	72.8	24.37	72.6	49.52	31.3	2.90	47.3
June 8.3	12.30	49.9	22.48	72.7	23.87	73.7	49.43	30.6	2.78	48.6
18.3	12.12	50.8	22.36	72.5	23.35	74.3	49.33	29.9	2.65	49.7
28.3	11.93	51.4	22.24	72.0	22.82	74.4	49.22	29.2	2.51	50.5
July 8.2	11.75	51.6	22.11	71.3	22.30	74.0	49.11	28.5	2.37	51.0
18.2	11.57	51.3	21.98	70.4	21.80	73.0	48.99	27.8	2.23	51.2
28.2	11.40	50.7	21.85	69.4	21.34	71.5	48.88	27.2	2.09	51.1
Aug. 7.1	11.25	49.7	21.73	68.2	20.91	69.6	48.78	26.7	1.96	50.7
17.1	11.11	48.4	21.63	67.0	20.54	67.2	48.69	26.3	1.84	50.0
27.1	11.00	46.7	21.54	65.7	20.24	64.5	48.61	25.9	1.74	49.0
Sept. 6.1	10.92	44.7	21.48	64.4	20.00	61.4	48.55	25.8	1.67	47.7
16.0	10.88	42.4	21.46	63.2	19.85	58.1	48.52	25.8	1.62	46.1
26.0	10.88	39.8	21.47	62.2	19.79	54.6	48.53	26.0	1.60	44.2
Oct. 6.0	10.92	37.0	21.52	61.3	19.83	50.9	48.57	26.4	1.63	42.1
16.0	11.02	34.1	21.62	60.7	19.97	47.2	48.65	27.1	1.70	39.8
25.9	11.16	31.0	21.76	60.4	20.21	43.5	48.77	28.1	1.82	37.2
Nov. 4.9	11.36	27.9	21.95	60.4	20.56	39.9	48.94	29.3	1.98	34.6
14.9	11.61	24.9	22.19	60.8	21.01	36.5	49.15	30.8	2.19	31.9
24.8	11.91	21.9	22.46	61.6	21.55	33.4	49.40	32.5	2.45	29.1
Dec. 4.8	12.25	19.2	22.77	62.8	22.18	30.8	49.69	34.4	2.74	26.4
14.8	12.62	16.7	23.10	64.3	22.87	28.6	49.99	36.4	3.06	23.9
24.8	13.01	14.6	23.45	66.1	23.61	26.9	50.31	38.5	3.40	21.6
34.7	13.41	13.0	23.79	68.1	24.37	25.8	50.63	40.6	3.75	19.6

## FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	32 <sup>d</sup> Camelop. (H.).		α Canum Venat.		δ Muscæ.		γ Virginis.		θ Virginis.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.
	h m 12 48	° ' " +83 55	h m 12 51	° ' " +38 49	h m 12 55	° ' " -71 1	h m 12 57	° ' " +11 28	h m 13 4	° ' " -5 1
Jan. 0.8	18.07	46.4	31.73	60.3	40.96	31.2	23.68	26.9	58.64	32.8
10.7	20.25	45.8	32.11	58.7	41.75	32.4	24.01	24.9	58.96	34.9
20.7	22.41	45.9	32.48	57.6	42.52	34.1	24.33	23.1	59.27	36.9
30.7	24.48	46.6	32.83	57.0	43.24	36.4	24.62	21.6	59.57	38.7
Feb. 9.7	26.39	48.0	33.16	56.9	43.90	39.1	24.90	20.5	59.84	40.4
19.6	28.06	49.9	33.44	57.3	44.47	42.1	25.14	19.7	60.08	41.9
29.6	29.43	52.3	33.68	58.3	44.95	45.3	25.34	19.3	60.29	43.1
Mar. 10.6	30.46	55.1	33.86	59.6	45.33	48.8	25.50	19.2	60.46	44.1
20.5	31.13	58.2	34.00	61.3	45.62	52.3	25.63	19.5	60.59	44.8
30.5	31.40	61.3	34.08	63.3	45.80	55.8	25.71	20.0	60.69	45.3
Apr. 9.5	31.29	64.5	34.12	65.5	45.89	59.3	25.76	20.7	60.75	45.5
19.5	30.81	67.6	34.11	67.7	45.88	62.7	25.78	21.6	60.78	45.6
29.4	29.99	70.5	34.07	70.0	45.77	65.8	25.77	22.7	60.78	45.4
May 9.4	28.86	73.0	33.99	72.1	45.58	68.7	25.74	23.8	60.76	45.1
19.4	27.47	75.1	33.88	74.1	45.32	71.2	25.68	24.9	60.72	44.7
29.4	25.87	76.8	33.75	75.8	44.98	73.4	25.60	26.0	60.66	44.2
June 8.3	24.12	77.9	33.60	77.3	44.57	75.1	25.51	27.0	60.58	43.7
18.3	22.26	78.5	33.44	78.4	44.11	76.4	25.41	28.0	60.49	43.1
28.3	20.36	78.6	33.27	79.2	43.61	77.2	25.30	28.8	60.38	42.4
July 8.2	18.45	78.1	33.09	79.6	43.08	77.5	25.18	29.5	60.27	41.7
18.2	16.59	77.0	32.92	79.6	42.54	77.2	25.06	30.0	60.16	41.1
28.2	14.83	75.4	32.75	79.3	42.00	76.4	24.94	30.4	60.04	40.4
Aug. 7.2	13.19	73.4	32.59	78.5	41.49	75.2	24.82	30.6	59.92	39.8
17.1	11.73	70.9	32.44	77.4	41.01	73.4	24.71	30.5	59.81	39.2
27.1	10.47	68.0	32.32	76.0	40.59	71.3	24.62	30.3	59.71	38.8
Sept. 6.1	9.43	64.8	32.22	74.2	40.25	68.8	24.55	29.8	59.63	38.4
16.1	8.66	61.3	32.15	72.1	40.01	66.1	24.50	29.1	59.58	38.2
26.0	8.17	57.7	32.12	69.7	39.88	63.2	24.48	28.2	59.55	38.2
Oct. 6.0	7.98	53.9	32.13	67.1	39.87	60.3	24.50	27.0	59.57	38.4
16.0	8.10	50.1	32.19	64.2	39.99	57.5	24.55	25.6	59.62	38.8
Nov. 25.9	8.55	46.3	32.31	61.2	40.24	54.8	24.66	23.9	59.72	39.5
4.9	9.32	42.6	32.48	58.2	40.62	52.5	24.81	22.1	59.87	40.5
14.9	10.41	39.2	32.70	55.1	41.12	50.5	25.00	20.0	60.06	41.7
24.9	11.79	36.2	32.97	52.1	41.73	49.0	25.23	17.8	60.29	43.2
Dec. 4.8	13.44	33.5	33.28	49.2	42.42	48.1	25.50	15.5	60.56	44.9
14.8	15.32	31.3	33.62	46.6	43.17	47.8	25.80	13.2	60.86	46.8
24.8	17.38	29.7	33.99	44.2	43.96	48.0	26.12	10.9	61.17	48.8
34.8	19.54	28.7	34.38	42.3	44.76	48.9	26.45	8.8	61.50	50.8



# FIXED STARS, 1904.

365

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	20 Canum Venat.		α Virginia. (Spica.)		κ Octantis.		ζ Virginis.		B. A. C. 4536.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.
	h m 13 13	° ' +41 4	h m 13 20	° ' -10 39	h m 13 25	° ' -85 17	h m 13 29	° ' - 0 6	h m 13 30	° ' +37 39
	s "	"	s "	"	s "	"	s "	"	s "	"
Jan. 0.8	13.61	29.2	7.96	31.7	21.54	16.6	47.77	16.5	29.88	77.3
10.8	14.00	27.4	8.29	33.7	24.46	17.1	48.09	18.5	30.25	75.3
20.7	14.38	26.1	8.61	35.7	27.35	18.1	48.41	20.4	30.62	73.8
30.7	14.75	25.4	8.92	37.6	30.12	19.7	48.71	22.2	30.98	72.8
Feb. 9.7	15.10	25.2	9.20	39.4	32.71	21.8	48.99	23.7	31.32	72.4
19.6	15.41	25.6	9.45	41.1	35.05	24.4	49.25	25.0	31.63	72.5
29.6	15.67	26.5	9.67	42.5	37.10	27.4	49.47	26.0	31.90	73.1
Mar. 10.6	15.88	27.8	9.86	43.8	38.82	30.7	49.66	26.8	32.12	74.2
20.6	16.05	29.6	10.01	44.8	40.18	34.2	49.82	27.2	32.30	75.8
30.6	16.16	31.7	10.12	45.6	41.15	37.8	49.94	27.3	32.43	77.7
Apr. 9.5	16.22	33.9	10.20	46.2	41.74	41.5	50.02	27.2	32.52	79.8
19.5	16.24	36.3	10.24	46.5	41.93	45.1	50.07	26.9	32.56	82.0
29.5	16.22	38.7	10.26	46.7	41.72	48.7	50.10	26.5	32.56	84.3
May 9.4	16.15	41.0	10.26	46.7	41.13	52.1	50.10	25.9	32.52	86.6
19.4	16.06	43.2	10.23	46.6	40.17	55.2	50.07	25.2	32.45	88.8
29.4	15.94	45.1	10.18	46.3	38.86	58.0	50.03	24.5	32.36	90.8
June 8.3	15.79	46.8	10.11	45.9	37.24	60.5	49.96	23.8	32.24	92.6
18.3	15.63	48.1	10.02	45.5	35.34	62.5	49.88	23.0	32.09	94.1
28.3	15.45	49.1	9.92	44.9	33.21	64.0	49.78	22.2	31.93	95.2
July 8.3	15.26	49.7	9.81	44.3	30.92	65.0	49.67	21.5	31.76	95.9
18.2	15.07	49.8	9.69	43.7	28.52	65.4	49.55	20.9	31.58	96.3
28.2	14.88	49.6	9.56	43.0	26.09	65.3	49.43	20.3	31.40	96.3
Aug. 7.2	14.70	49.0	9.43	42.3	23.71	64.6	49.30	19.8	31.22	95.9
17.2	14.53	47.9	9.31	41.6	21.46	63.3	49.18	19.4	31.05	95.2
27.1	14.38	46.5	9.20	40.9	19.41	61.5	49.07	19.1	30.89	94.0
Sept. 6.1	14.25	44.7	9.11	40.3	17.65	59.3	48.97	19.0	30.75	92.4
16.1	14.15	42.6	9.04	39.8	16.25	56.7	48.89	19.1	30.64	90.6
26.0	14.09	40.2	9.00	39.5	15.27	53.8	48.84	19.3	30.56	88.4
Oct. 6.0	14.07	37.5	9.00	39.4	14.75	50.7	48.83	19.8	30.53	85.9
16.0	14.10	34.6	9.04	39.5	14.74	47.5	48.86	20.5	30.54	83.1
26.0	14.19	31.5	9.13	39.8	15.25	44.4	48.94	21.5	30.60	80.2
Nov. 4.9	14.33	28.3	9.27	40.4	16.26	41.5	49.06	22.7	30.72	77.1
14.9	14.52	25.1	9.45	41.3	17.74	38.9	49.22	24.1	30.89	73.9
24.9	14.77	21.9	9.67	42.4	19.66	36.7	49.43	25.8	31.11	70.8
Dec. 4.9	15.07	18.9	9.93	43.8	21.94	35.0	49.68	27.6	31.39	67.7
14.8	15.41	16.1	10.23	45.5	24.51	33.9	49.96	29.6	31.70	64.8
24.8	15.78	13.6	10.54	47.3	27.28	33.3	50.27	31.7	32.04	62.2
34.8	16.16	11.5	10.87	49.2	30.15	33.4	50.59	33.8	32.41	59.8

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	♍ Virginis.		♊ Ursæ Majoris.		♉ Bootis.		♋ Apodis.		♐ Centauri.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.
	h m 13 36	° — 8 13	h m 13 43	° +49 47	h m 13 50	° +18 52	h m 13 55	° —76 19	h m 13 57	° —59 54
Jan. 0.8	34.11	2.2	44.28	20.3	6.23	40.3	57.75	38.1	2.73	15.7
10.8	34.43	3.2	44.71	18.3	6.55	38.1	58.83	38.3	3.29	16.3
20.8	34.75	4.1	45.14	16.9	6.88	36.2	59.92	39.1	3.85	17.5
30.7	35.06	5.1	45.56	16.1	7.20	34.7	60.98	40.5	4.40	19.1
Feb. 9.7	35.35	6.1	45.96	15.9	7.50	33.6	62.00	42.3	4.92	21.0
19.7	35.61	7.1	46.33	16.3	7.78	32.9	62.95	44.6	5.40	23.3
29.6	35.84	8.1	46.66	17.3	8.03	32.7	63.80	47.2	5.83	25.9
Mar. 10.6	36.04	9.1	46.94	18.8	8.24	32.9	64.54	50.2	6.21	28.7
20.6	36.20	10.1	47.16	20.7	8.42	33.5	65.17	53.4	6.53	31.6
30.6	36.33	11.1	47.33	23.0	8.56	34.4	65.67	56.7	6.79	34.5
Apr. 9.5	36.42	12.1	47.44	25.6	8.66	35.5	66.04	60.1	6.99	37.5
19.5	36.48	13.1	47.49	28.3	8.73	36.9	66.28	63.6	7.13	40.4
29.5	36.52	14.1	47.49	31.1	8.76	38.4	66.39	67.0	7.21	43.2
May 9.5	36.53	15.1	47.44	33.8	8.77	40.0	66.36	70.2	7.24	45.8
19.4	36.51	16.1	47.35	36.3	8.75	41.6	66.20	73.2	7.20	48.2
29.4	36.47	17.1	47.21	38.6	8.70	43.2	65.91	76.0	7.11	50.4
June 8.4	36.41	18.1	47.05	40.6	8.63	44.6	65.51	78.4	6.96	52.3
18.3	36.34	19.1	46.85	42.3	8.55	45.9	65.00	80.5	6.77	53.8
28.3	36.24	20.1	46.63	43.5	8.44	47.0	64.39	82.1	6.53	54.9
July 8.3	36.13	21.1	46.40	44.3	8.32	47.9	63.70	83.2	6.26	55.6
18.3	36.01	22.1	46.16	44.7	8.19	48.6	62.96	83.8	5.95	55.9
28.2	35.89	23.1	45.91	44.6	8.04	49.0	62.17	83.9	5.63	55.7
Aug. 7.2	35.76	24.1	45.66	44.0	7.90	49.2	61.38	83.5	5.30	55.1
17.2	35.63	25.1	45.42	43.0	7.76	49.1	60.61	82.5	4.97	54.0
27.2	35.51	26.1	45.20	41.5	7.62	48.7	59.88	81.0	4.65	52.5
Sept. 6.1	35.41	27.1	45.00	39.6	7.50	48.0	59.23	79.1	4.37	50.7
16.1	35.32	28.1	44.83	37.3	7.40	47.0	58.68	76.8	4.14	48.6
26.1	35.27	29.1	44.71	34.7	7.32	45.8	58.26	74.1	3.97	46.3
Oct. 6.0	35.25	30.1	44.63	31.8	7.28	44.3	58.00	71.3	3.86	43.9
16.0	35.28	31.1	44.60	28.6	7.28	42.5	57.91	68.3	3.84	41.4
26.0	35.35	32.1	44.64	25.2	7.33	40.4	58.00	65.4	3.91	39.0
Nov. 5.0	35.47	33.1	44.74	21.7	7.42	38.2	58.27	62.6	4.07	36.8
14.9	35.63	34.1	44.90	18.2	7.56	35.8	58.73	60.0	4.32	34.8
24.9	35.84	35.1	45.13	14.7	7.75	33.2	59.36	57.8	4.66	33.2
Dec. 4.9	36.09	36.1	45.42	11.4	7.99	30.6	60.13	56.0	5.07	32.1
14.8	36.37	37.1	45.76	8.3	8.26	28.0	61.03	54.7	5.54	31.4
24.8	36.68	38.1	46.15	5.6	8.56	25.5	62.02	54.0	6.05	31.2
34.8	37.00	39.1	46.56	3.3	8.88	23.2	63.08	53.9	6.60	31.6

# FIXED STARS, 1904.

367

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	π Hydræ.			α Draconis.			δ Bootis.			κ Virginis.			4 Ursæ Minoris.		
	Right Ascension.	Declina- tion South.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion South.		Right Ascension.	Declina- tion North.	
	h m 14 0	° ' " -26 13		h m 14 1	° ' " +64 49		h m 14 6	° ' " +25 32		h m 14 7	° ' " - 9 49		h m 14 9	° ' " +77 59	
	s	"		s	"		s	"		s	"		s	"	
Jan. 0.8	53.93	0.5	45.09	51.3	1.9	0.57	41.8	46.02	30.7	7.59	41.2	1.8	7.59	1.04	41.2
10.8	54.28	2.0	45.66	49.4	1.4	0.90	39.5	46.34	32.5	8.63	39.4	1.2	8.63	1.11	39.4
20.8	54.63	3.7	46.26	48.0	0.7	1.24	37.6	46.66	34.3	9.74	38.2	0.5	9.74	1.13	38.2
30.7	54.97	5.5	46.86	47.3	0.0	1.57	36.2	46.98	36.0	10.87	37.7	0.2	10.87	1.12	37.7
Feb. 9.7	55.29	7.4	47.44	47.3	0.7	1.89	35.2	47.28	37.7	11.99	37.9	0.8	11.99	1.05	37.9
19.7	55.59	9.3	47.98	48.0	1.2	2.18	34.6	47.56	39.2	13.04	38.7	1.4	13.04	0.96	38.7
29.7	55.86	11.2	48.47	49.2	1.8	2.45	34.6	47.81	40.6	14.00	40.1	2.0	14.00	0.84	40.1
Mar. 10.6	56.09	13.0	48.90	51.0	2.3	2.68	35.0	48.04	41.7	14.84	42.1	2.5	14.84	0.68	42.1
20.6	56.29	14.7	49.25	53.3	2.7	2.88	35.8	48.23	42.5	15.52	44.6	2.8	15.52	0.50	44.6
30.6	56.46	16.2	49.51	56.0	2.9	3.04	37.1	48.39	43.2	16.02	47.4	3.1	16.02	0.33	47.4
Apr. 9.5	56.59	17.6	49.68	58.9	3.1	3.16	38.6	48.51	43.6	16.35	50.5	3.2	16.35	0.14	50.5
19.5	56.69	18.8	49.76	62.0	3.1	3.24	40.3	48.61	43.9	16.49	53.7	3.2	16.49	0.05	53.7
29.5	56.76	19.9	49.76	65.1	3.0	3.29	42.2	48.68	44.0	16.54	56.9	3.1	16.54	0.23	56.9
May 9.5	56.79	20.8	49.67	68.1	2.9	3.31	44.2	48.72	43.9	16.21	60.0	2.9	16.21	0.39	60.0
19.4	56.80	21.5	49.51	71.0	2.5	3.29	46.1	48.73	43.7	15.82	62.9	2.5	15.82	0.55	62.9
29.4	56.78	22.1	49.29	73.5	2.2	3.25	48.0	48.71	43.4	15.27	65.4	2.2	15.27	0.67	65.4
June 8.4	56.73	22.5	49.00	75.7	1.8	3.18	49.7	48.68	43.0	14.60	67.6	1.7	14.60	0.78	67.6
18.4	56.66	22.7	48.66	77.5	1.4	3.09	51.2	48.62	42.5	13.82	69.3	1.3	13.82	0.87	69.3
28.3	56.56	22.7	48.29	78.9	0.8	2.98	52.5	48.54	42.0	12.95	70.6	0.7	12.95	0.93	70.6
July 8.3	56.44	22.5	47.88	79.7	0.4	2.85	53.6	48.44	41.4	12.02	71.3	0.2	12.02	0.97	71.3
18.3	56.31	22.1	47.46	80.1	0.2	2.70	54.4	48.32	40.8	11.05	71.5	0.3	11.05	0.98	71.5
28.2	56.16	21.6	47.02	79.9	0.8	2.55	54.8	48.19	40.2	10.07	71.2	0.9	10.07	0.98	71.2
Aug. 7.2	56.01	20.9	46.59	79.1	1.2	2.39	54.9	48.05	39.7	9.09	70.3	1.4	9.09	0.95	70.3
17.2	55.85	20.0	46.17	77.9	1.7	2.23	54.7	47.91	39.1	8.14	68.9	1.9	8.14	0.90	68.9
27.2	55.70	19.1	45.77	76.2	2.1	2.07	54.2	47.78	38.5	7.24	67.0	2.3	7.24	0.82	67.0
Sept. 6.1	55.56	18.0	45.41	74.1	2.6	1.93	53.4	47.65	38.0	6.42	64.7	2.8	6.42	0.74	64.7
16.1	55.45	17.0	45.09	71.5	2.9	1.80	52.2	47.55	37.7	5.68	61.9	3.1	5.68	0.62	61.9
26.1	55.37	15.9	44.83	68.6	3.3	1.70	50.7	47.47	37.4	5.06	58.8	3.4	5.06	0.48	58.8
Oct. 6.1	55.32	14.9	44.64	65.3	3.5	1.64	48.8	47.42	37.3	4.58	55.4	3.6	4.58	0.33	55.4
16.0	55.32	14.1	44.53	61.8	3.7	1.62	46.7	47.41	37.4	4.25	51.8	3.7	4.25	0.17	51.8
26.0	55.37	13.4	44.50	58.1	3.7	1.65	44.4	47.45	37.7	4.08	48.1	3.9	4.08	0.01	48.1
Nov. 5.0	55.47	13.0	44.56	54.4	3.8	1.72	41.8	47.54	38.3	4.09	44.2	3.8	4.09	0.20	44.2
14.9	55.63	12.8	44.72	50.6	3.7	1.85	39.1	47.68	39.1	4.29	40.4	3.7	4.29	0.36	40.4
24.9	55.84	13.0	44.97	46.9	3.5	2.02	36.3	47.86	40.2	4.67	36.7	3.4	4.67	0.58	36.7
Dec. 4.9	56.10	13.5	45.32	43.4	3.2	2.24	33.4	48.09	41.5	5.23	33.3	3.2	5.23	0.73	33.3
14.9	56.39	14.3	45.75	40.2	2.8	2.51	30.6	48.35	43.0	5.96	30.1	2.7	5.96	0.88	30.1
24.8	56.71	15.4	46.24	37.4	2.4	2.81	27.9	48.65	44.6	6.84	27.4	2.2	6.84	0.99	27.4
34.8	57.05	16.7	46.79	35.0		3.13	25.5	48.96	46.4	7.83	25.2		7.83		25.2

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	<i>a</i> Bootis. ( <i>Arcturus</i> .)		<i>δ</i> Octantis.		<i>λ</i> Bootis.		<i>λ</i> Virginis.		<i>θ</i> Bootis.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.
	h m 14 11	° ' " +19 40	h m 14 11	° ' " -83 13	h m 14 12	° ' " +46 31	h m 14 13	° ' " -12 55	h m 14 21	° ' " +52 17
	s	"	s	"	s	"	s	"	s	"
Jan. 0.8	16.21	52.7	28.34	19.2	42.77	34.9	54.40	37.9	54.12	29.7
10.8	16.53	50.4	30.40	19.0	43.16	32.6	54.72	39.6	54.54	27.3
20.8	16.85	48.4	32.51	19.4	43.57	30.9	55.04	41.4	54.97	25.5
30.7	17.17	46.8	34.60	20.4	43.97	29.7	55.36	43.2	55.42	24.4
Feb. 9.7	17.48	45.6	36.62	21.9	44.36	29.1	55.67	44.9	55.85	23.8
19.7	17.77	44.8	38.52	23.9	44.73	29.1	55.95	46.4	56.26	23.9
29.7	18.03	44.4	40.26	26.3	45.06	29.8	56.21	47.8	56.63	24.6
Mar. 10.6	18.25	44.5	41.82	29.1	45.36	31.0	56.44	49.1	56.96	25.9
20.6	18.45	45.0	43.15	32.2	45.60	32.6	56.64	50.1	57.24	27.7
30.6	18.61	45.9	44.24	35.5	45.80	34.7	56.81	50.9	57.47	29.9
Apr. 9.5	18.73	47.1	45.08	39.0	45.94	37.1	56.94	51.5	57.64	32.4
19.5	18.82	48.5	45.64	42.5	46.03	39.7	57.05	51.9	57.74	35.2
29.5	18.87	50.0	45.93	46.0	46.08	42.5	57.12	52.2	57.80	38.1
May 9.5	18.89	51.7	45.94	49.4	46.08	45.2	57.17	52.3	57.79	40.9
19.4	18.89	53.3	45.68	52.7	46.03	47.8	57.19	52.2	57.74	43.7
29.4	18.86	55.0	45.14	55.8	45.94	50.3	57.18	52.1	57.63	46.3
June 8.4	18.80	56.5	44.35	58.5	45.81	52.6	57.15	51.8	57.49	48.7
18.4	18.72	57.8	43.33	60.9	45.65	54.5	57.09	51.5	57.30	50.7
28.3	18.62	59.0	42.09	62.9	45.47	56.0	57.01	51.1	57.09	52.3
July 8.3	18.50	60.0	40.68	64.4	45.26	57.2	56.91	50.6	56.84	53.5
18.3	18.36	60.8	39.14	65.4	45.04	57.9	56.79	50.1	56.58	54.3
28.3	18.22	61.2	37.50	65.8	44.80	58.1	56.66	49.5	56.30	54.6
Aug. 7.2	18.06	61.4	35.83	65.6	44.56	57.9	56.52	48.9	56.01	54.3
17.2	17.91	61.4	34.18	64.9	44.32	57.3	56.38	48.3	55.73	53.6
27.2	17.76	61.0	32.61	63.7	44.09	56.2	56.24	47.7	55.45	52.5
Sept. 6.1	17.62	60.3	31.18	61.9	43.88	54.6	56.11	47.1	55.19	50.8
16.1	17.49	59.4	29.95	59.7	43.69	52.7	56.00	46.6	54.96	48.8
26.1	17.39	58.1	28.97	57.2	43.53	50.4	55.91	46.2	54.77	46.3
Oct. 6.1	17.33	56.5	28.28	54.3	43.42	47.7	55.85	46.0	54.62	43.5
16.0	17.31	54.7	27.93	51.2	43.36	44.7	55.84	45.9	54.52	40.4
26.0	17.33	52.6	27.93	48.1	43.35	41.5	55.88	46.0	54.49	37.0
Nov. 5.0	17.40	50.3	28.30	45.1	43.41	38.2	55.96	46.3	54.52	33.5
15.0	17.51	47.8	29.03	42.3	43.53	34.7	56.09	46.9	54.63	29.9
24.9	17.68	45.2	30.10	39.7	43.71	31.2	56.27	47.8	54.80	26.2
Dec. 4.9	17.90	42.5	31.48	37.6	43.95	27.8	56.50	49.0	55.04	22.7
14.9	18.15	39.8	33.12	35.9	44.24	24.6	56.76	50.3	55.35	19.3
24.8	18.44	37.2	34.96	34.8	44.59	21.6	57.06	51.8	55.71	16.3
34.8	18.75	34.7	36.95	34.2	44.96	19.1	57.37	53.5	56.11	13.6

# FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

369

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	<i>p</i> Bootis.		5 Ursæ Minoris.		$\alpha^4$ Centauri.		33 Bootis.		$\alpha$ Apodis.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.
	h m 14 27	° ' " +30 47	h m 14 27	° ' " +76 6	h m 14 33	° ' " -60 26	h m 14 35	° ' " +44 48	h m 14 35	° ' " -78 37
	s	"	s	"	s	"	s	"	s	"
Jan. 0.8	40.58	28.6	38.38	70.0	4.03	1.3	14.50	59.4	53.61	52.2
	-33	2.4	.88	2.1	-54	0.1	-17	2.5	1.25	0.4
10.8	40.91	26.2	39.26	67.9	4.57	1.4	14.87	56.9	54.86	51.8
	-34	2.0	.95	1.4	-56	0.6	-39	2.0	1.30	0.1
20.8	41.25	24.2	40.21	66.5	5.13	2.0	15.26	54.9	56.16	51.9
	-34	1.5	.98	0.8	-55	1.1	-39	1.4	1.31	0.7
30.8	41.59	22.7	41.19	65.7	5.68	3.1	15.65	53.5	57.47	52.6
	-33	1.1	.98	0.1	-54	1.5	-38	0.8	1.28	1.2
Feb. 9.7	41.92	21.6	42.17	65.6	6.22	4.6	16.03	52.7	58.75	53.8
	-32	0.5	.95	0.5	-52	1.8	-37	0.3	1.23	1.7
19.7	42.24	21.1	43.12	66.1	6.74	6.4	16.40	52.4	59.98	55.5
	-29	0.1	.87	1.2	-47	2.1	-34	0.4	1.14	2.1
29.7	42.53	21.2	43.99	67.3	7.21	8.5	16.74	52.8	61.12	57.6
	-25	0.5	.78	1.8	-43	2.4	-31	1.0	1.05	2.5
Mar. 10.6	42.78	21.7	44.77	69.1	7.64	10.9	17.05	53.8	62.17	60.1
	-22	1.0	.65	2.2	-38	2.6	-26	1.5	0.92	2.9
20.6	43.00	22.7	45.42	71.3	8.02	13.5	17.31	55.3	63.09	63.0
	-19	1.4	.51	2.7	-32	2.7	-22	1.9	0.79	3.0
30.6	43.19	24.1	45.93	74.0	8.34	16.2	17.53	57.2	63.88	66.0
	-15	1.7	.36	3.0	-26	2.7	-17	2.2	0.65	3.2
Apr. 9.6	43.34	25.8	46.29	77.0	8.60	18.9	17.70	59.4	64.53	69.2
	-10	2.0	.20	3.2	-21	2.8	-12	2.6	0.48	3.3
19.5	43.44	27.8	46.49	80.2	8.81	21.7	17.82	62.0	65.01	72.5
	-07	2.2	.03	3.2	-14	2.8	-08	2.6	0.33	3.4
29.5	43.51	30.0	46.52	83.4	8.95	24.5	17.90	64.6	65.34	75.9
	-04	2.2	.12	3.1	-08	2.6	-03	2.8	0.16	3.3
May 9.5	43.55	32.2	46.40	86.5	9.03	27.1	17.93	67.4	65.50	79.2
	-00	2.2	.27	3.0	.02	2.5	.02	2.7	0.00	3.2
19.5	43.55	34.4	46.13	89.5	9.05	29.6	17.91	70.1	65.50	82.4
	-04	2.2	.40	2.8	.04	2.3	.06	2.6	0.17	3.0
29.4	43.51	36.6	45.73	92.3	9.01	31.9	17.85	72.7	65.33	85.4
	-06	2.0	.52	2.4	.10	2.1	.10	2.3	0.33	2.8
June 8.4	43.45	38.6	45.21	94.7	8.91	34.0	17.75	75.0	65.00	88.2
	-09	1.8	.63	1.9	.15	1.7	.13	2.1	0.48	2.4
18.4	43.36	40.4	44.58	96.6	8.76	35.7	17.62	77.1	64.52	90.6
	-11	1.5	.71	1.5	.21	1.4	.16	1.8	0.62	2.1
28.3	43.25	41.9	43.87	98.1	8.55	37.1	17.46	78.9	63.90	92.7
	-14	1.3	.77	1.0	.26	1.1	.19	1.3	0.74	1.6
July 8.3	43.11	43.7	43.10	99.1	8.29	38.2	17.27	80.2	63.16	94.3
	-16	0.9	.83	0.5	.30	0.6	.21	1.0	0.84	1.2
18.3	42.95	44.1	42.27	99.6	7.99	38.8	17.06	81.2	62.32	95.5
	-17	0.6	.85	0.0	.34	0.2	.23	0.5	0.92	0.7
28.3	42.78	44.7	41.42	99.6	7.65	39.0	16.83	81.7	61.40	96.2
	-18	0.2	.86	0.6	.35	0.2	.24	0.1	0.96	0.0
Aug. 7.2	42.60	44.9	40.56	99.0	7.30	38.8	16.59	81.8	60.44	96.2
	-18	0.2	.85	1.1	.36	0.7	.24	0.4	0.98	0.4
17.2	42.42	44.7	39.71	97.9	6.94	38.1	16.35	81.4	59.46	95.8
	-18	0.5	.81	1.6	.36	1.1	.24	0.8	0.95	1.0
27.2	42.24	44.2	38.90	96.3	6.58	37.0	16.11	80.6	58.51	94.8
	-17	0.9	.76	2.1	.34	1.5	.22	1.3	0.89	1.5
Sept. 6.2	42.07	43.3	38.14	94.2	6.24	35.5	15.89	79.3	57.62	93.3
	-15	1.3	.69	2.5	.29	1.8	.21	1.7	0.79	1.9
16.1	41.92	42.0	37.45	91.7	5.95	33.7	15.68	77.6	56.83	91.4
	-13	1.6	.60	2.9	.25	2.1	.17	2.1	0.66	2.3
26.1	41.79	40.4	36.85	88.8	5.70	31.6	15.51	75.5	56.17	89.1
	-10	2.0	.49	3.2	.18	2.3	.14	2.5	0.50	2.7
Oct. 6.1	41.69	38.4	36.36	85.6	5.52	29.3	15.37	73.0	55.67	86.4
	-05	2.3	.36	3.5	.10	2.4	.09	2.8	0.30	2.9
16.0	41.64	36.1	36.00	82.1	5.42	26.9	15.28	70.2	55.37	83.5
	-00	2.5	.22	3.7	.01	2.4	.04	3.1	0.09	3.0
26.0	41.64	33.6	35.78	78.4	5.41	24.5	15.24	67.1	55.28	80.5
	-04	2.3	.06	3.8	.08	2.3	.03	3.3	0.13	2.9
Nov. 5.0	41.68	30.8	35.72	74.6	5.49	22.2	15.27	63.8	55.41	77.6
	-10	2.9	.10	3.9	.17	2.2	.08	3.4	0.36	2.8
15.0	41.78	27.9	35.82	70.7	5.66	20.0	15.35	60.4	55.77	74.8
	-16	3.0	.27	3.7	.27	1.9	.15	3.5	0.58	2.6
24.9	41.94	24.9	36.09	67.0	5.93	18.1	15.50	56.9	56.35	72.2
	-20	3.1	.42	3.6	.35	1.5	.21	3.5	0.77	2.3
Dec. 4.9	42.14	21.8	36.51	63.4	6.28	16.6	15.71	53.4	57.12	69.9
	-25	3.0	.58	3.3	.42	1.1	.26	3.3	0.94	1.8
14.9	42.39	18.8	37.09	60.1	6.70	15.5	15.97	50.1	58.06	68.1
	-29	2.8	.72	2.9	.48	0.6	.31	3.1	1.09	1.3
24.9	42.68	16.0	37.81	57.2	7.18	14.9	16.28	47.0	59.15	66.8
	-32	2.6	.83	2.5	.52	0.2	.35	2.7	1.20	0.8
34.8	43.00	13.4	38.64	54.7	7.70	14.7	16.63	44.3	60.35	66.0

# FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\epsilon$ Bootis.		$\alpha^2$ Libræ.		$\beta$ Ursæ Minoris.		$\beta$ Bootis.		$\gamma$ Scorpii.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.
	h m 14 40	° +27 28	h m 14 45	° -15 38	h m 14 50	° +74 32	h m 14 58	° +40 45	h m 14 58	° -24 54
	s	"	s	"	s	"	s	"	s	"
Jan. 0.8	46.66	40.1	33.38	25.4	54.19	41.9	18.40	63.2	26.37	5.0
10.8	46.98	37.7	33.70	27.0	54.95	39.5	18.73	60.5	26.70	6.1
20.8	47.31	35.6	34.02	28.5	55.78	37.7	19.09	58.3	27.04	7.4
30.8	47.64	33.9	34.34	30.1	56.66	36.6	19.46	56.6	27.38	8.8
Feb. 9.7	47.97	32.7	34.66	31.7	57.55	36.1	19.83	55.5	27.71	10.3
19.7	48.28	32.0	34.96	33.2	58.43	36.3	20.18	55.0	28.03	11.8
29.7	48.57	31.9	35.24	34.6	59.25	37.2	20.51	55.1	28.34	13.3
Mar. 10.7	48.83	32.2	35.50	35.8	60.00	38.7	20.82	55.7	28.61	14.7
20.6	49.06	33.0	35.72	36.8	60.65	40.7	21.09	56.9	28.86	16.0
30.6	49.25	34.2	35.92	37.6	61.18	43.2	21.32	58.6	29.08	17.2
Apr. 9.6	49.41	35.8	36.09	38.3	61.58	46.1	21.51	60.6	29.27	18.3
19.5	49.53	37.7	36.22	38.8	61.84	49.2	21.66	62.9	29.43	19.3
29.5	49.61	39.7	36.33	39.2	61.96	52.4	21.76	65.5	29.56	20.2
May 9.5	49.66	41.8	36.41	39.4	61.94	55.6	21.82	68.2	29.66	20.9
19.5	49.68	43.9	36.46	39.5	61.78	58.7	21.84	70.9	29.73	21.5
29.4	49.67	46.0	36.48	39.5	61.49	61.6	21.82	73.5	29.76	22.0
June 8.4	49.62	48.0	36.47	39.4	61.09	64.2	21.76	75.9	29.77	22.4
18.4	49.55	49.8	36.44	39.2	60.58	66.5	21.66	78.1	29.74	22.7
28.4	49.45	51.4	36.38	38.9	59.99	68.3	21.53	80.0	29.68	22.8
July 8.3	49.32	52.7	36.29	38.5	59.32	69.6	21.37	81.6	29.60	22.8
18.3	49.18	53.7	36.18	38.2	58.60	70.4	21.19	82.8	29.48	22.7
28.3	49.02	54.4	36.05	37.7	57.84	70.7	20.98	83.6	29.34	22.4
Aug. 7.2	48.85	54.7	35.91	37.2	57.05	70.5	20.76	83.9	29.19	22.0
17.2	48.67	54.7	35.75	36.6	56.27	69.8	20.53	83.8	29.02	21.5
27.2	48.49	54.3	35.60	36.1	55.50	68.5	20.30	83.3	28.85	20.9
Sept. 6.2	48.32	53.6	35.45	35.5	54.77	66.8	20.08	82.4	28.69	20.2
16.1	48.16	52.6	35.31	35.0	54.09	64.6	19.87	81.0	28.53	19.4
26.1	48.03	51.2	35.20	34.5	53.48	61.9	19.69	79.2	28.40	18.6
Oct. 6.1	47.93	49.4	35.12	34.1	52.97	58.9	19.54	77.0	28.30	17.8
16.1	47.87	47.3	35.08	33.9	52.57	55.6	19.43	74.5	28.25	17.0
26.0	47.85	45.0	35.08	33.8	52.29	52.0	19.37	71.7	28.24	16.4
Nov. 5.0	47.88	42.4	35.13	34.0	52.14	48.2	19.36	68.6	28.28	16.0
15.0	47.97	39.6	35.23	34.4	52.15	44.4	19.42	65.3	28.37	15.8
24.9	48.11	36.7	35.39	35.0	52.30	40.6	19.53	61.9	28.52	15.8
Dec. 4.9	48.30	33.7	35.59	35.8	52.61	36.9	19.71	58.5	28.72	16.0
14.9	48.53	30.8	35.83	36.9	53.07	33.4	19.94	55.2	28.97	16.5
24.9	48.80	28.0	36.11	38.2	53.66	30.3	20.22	52.0	29.26	17.3
34.8	49.11	25.3	36.42	39.7	54.36	27.6	20.53	49.2	29.57	18.3

# FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

371

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\delta$ Bootis.		$\beta$ Libræ.		$\gamma^2$ Ursæ Minoris.		$\mu^1$ Bootis.		$\rho$ Octantis.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.
	h m 15 11	° ' " +33 40	h m 15 11	° ' " - 9 1	h m 15 20	° ' " +72 10	h m 15 20	° ' " +37 42	h m 15 20	° ' " -84 8
Jan. 0.9	36.68	18.8	49.64	36.0	48.37	24.4	50.42	45.8	59.59	23.7
10.8	36.99	16.2	49.94	37.6	48.98	21.7	50.73	43.1	61.79	22.4
20.8	37.32	13.9	50.25	39.2	49.67	19.5	51.06	40.8	64.15	21.7
30.8	37.66	12.0	50.56	40.8	50.42	17.9	51.41	38.9	66.61	21.6
Feb. 9.8	38.01	10.7	50.87	42.3	51.19	17.0	51.77	37.5	69.11	22.0
19.7	38.34	9.9	51.17	43.6	51.97	16.8	52.11	36.7	71.58	23.0
29.7	38.65	9.7	51.45	44.7	52.72	17.2	52.44	36.5	73.97	24.4
Mar. 10.7	38.94	10.1	51.72	45.6	53.42	18.3	52.75	36.9	76.22	26.3
20.6	39.21	11.0	51.96	46.3	54.05	20.0	53.03	37.9	78.29	28.5
30.6	39.44	12.3	52.17	46.8	54.59	22.2	53.27	39.3	80.15	31.1
Apr. 9.6	39.63	14.0	52.35	47.0	55.03	24.9	53.48	41.2	81.75	34.0
19.6	39.79	16.1	52.51	47.1	55.35	27.8	53.65	43.4	83.08	37.1
29.5	39.91	18.4	52.64	47.0	55.55	31.0	53.78	45.8	84.11	40.4
May 9.5	39.99	20.8	52.74	46.8	55.63	34.2	53.87	48.4	84.81	43.7
19.5	40.03	23.3	52.81	46.4	55.59	37.4	53.92	51.1	85.18	47.0
29.5	40.03	25.7	52.86	46.0	55.43	40.5	53.93	53.7	85.21	50.3
June 8.4	40.00	28.1	52.87	45.5	55.16	43.4	53.90	56.2	84.91	53.4
18.4	39.94	30.2	52.85	45.0	54.80	45.9	53.83	58.5	84.27	56.2
28.4	39.84	32.1	52.81	44.4	54.34	48.1	53.73	60.5	83.32	58.8
July 8.3	39.72	33.7	52.74	43.9	53.81	49.9	53.59	62.3	82.08	61.1
18.3	39.56	35.0	52.64	43.4	53.21	51.1	53.43	63.7	80.59	62.9
28.3	39.39	35.9	52.52	42.9	52.57	51.9	53.24	64.7	78.89	64.2
Aug. 7.3	39.20	36.4	52.39	42.4	51.89	52.2	53.03	65.3	77.04	65.0
17.2	38.99	36.6	52.24	41.9	51.20	51.9	52.81	65.5	75.10	65.2
27.2	38.78	36.3	52.08	41.5	50.50	51.1	52.58	65.3	73.13	64.9
Sept. 6.2	38.58	35.7	51.92	41.2	49.82	49.8	52.36	64.6	71.21	64.0
16.2	38.39	34.6	51.77	40.9	49.18	48.0	52.14	63.5	69.42	62.5
26.1	38.21	33.1	51.64	40.7	48.59	45.7	51.95	62.0	67.83	60.6
Oct. 6.1	38.07	31.3	51.54	40.7	48.06	43.0	51.79	60.1	66.50	58.3
16.1	37.96	29.1	51.47	40.8	47.63	40.0	51.66	57.8	65.50	55.6
26.0	37.90	26.6	51.45	41.1	47.30	36.6	51.58	55.2	64.88	52.6
Nov. 5.0	37.89	23.9	51.47	41.6	47.08	33.0	51.55	52.3	64.67	49.6
15.0	37.93	20.9	51.55	42.3	46.99	29.3	51.58	49.2	64.89	46.5
25.0	38.03	17.7	51.67	43.3	47.04	25.4	51.66	45.9	65.54	43.5
Dec. 4.9	38.19	14.5	51.84	44.4	47.22	21.6	51.81	42.6	66.60	40.7
14.9	38.40	11.4	52.06	45.8	47.54	18.0	52.01	39.3	68.03	38.3
24.9	38.65	8.3	52.31	47.3	47.99	14.6	52.26	36.1	69.80	36.3
34.9	38.94	5.4	52.59	48.8	48.54	11.6	52.55	33.2	71.85	34.7

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\beta$ Coronæ Borealis.			$\alpha$ Coronæ Borealis.			$\alpha$ Serpentis.			$\epsilon$ Serpentis.			$\zeta$ Ursæ Minoris.		
	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.
	h m	s	'	h m	s	'	h m	s	'	h m	s	'	h m	s	'
	15 23		+29 25	15 30		+27 2	15 39		+6 43	15 46		+4 45	15 47		+78 5
Jan. 0.9	51.04		69.7	36.17		14.6	31.34		43.3	0.80		64.9	21.82		18.4
10.9	51.33	.29	67.1	36.45	.28	12.0	31.62	.28	41.3	1.07	.27	62.9	22.59	.77	15.6
20.8	51.64	.31	64.8	36.76	.31	9.7	31.90	.28	39.3	1.35	.28	61.0	23.49	.90	13.2
30.8	51.97	.33	62.8	37.08	.32	7.7	32.21	.31	37.6	1.65	.30	59.3	24.50	1.01	11.4
Feb. 9.8	52.30	.33	61.4	37.41	.33	6.2	32.51	.30	36.1	1.96	.31	57.8	25.58	1.08	10.2
		.32	59.9		.31	1.0		.30	1.2		.29	1.1		1.12	0.5
19.7	52.62		60.5	37.72		5.2	32.81		34.9	2.25		56.7	26.70		9.7
29.7	52.93	.31	60.1	38.03	.31	4.8	33.10	.29	34.1	2.54	.29	55.8	27.80	1.10	9.9
Mar. 10.7	53.22	.29	60.3	38.32	.29	4.8	33.37	.27	33.6	2.81	.27	55.3	28.86	1.06	10.7
20.7	53.48	.26	61.0	38.58	.26	5.4	33.62	.25	33.5	3.07	.26	55.1	29.83	.97	12.2
30.6	53.71	.23	62.1	38.81	.23	6.4	33.84	.22	33.7	3.30	.23	55.3	30.68	.85	14.2
		.20	1.5		.21	1.4		.20	0.6		.21	0.4		0.72	2.4
Apr. 9.6	53.91		63.6	39.02		7.8	34.04		34.3	3.51		55.7	31.40		16.6
19.6	54.07	.16	65.5	39.19	.17	9.6	34.22	.18	35.1	3.69	.18	56.5	31.95	.55	19.4
29.6	54.20	.13	67.6	39.33	.14	11.6	34.37	.15	36.1	3.84	.15	57.4	32.32	.37	22.5
May 9.5	54.30	.10	69.9	39.43	.10	13.8	34.48	.11	37.3	3.97	.13	58.5	32.52	.20	25.7
19.5	54.36	.06	72.3	39.50	.07	16.0	34.58	.10	38.6	4.06	.09	59.7	32.53	.01	29.0
		.02	2.3		.03	2.3		.05	1.4		.07	1.3		0.17	3.1
29.5	54.38		74.6	39.53		18.3	34.63		40.0	4.13		61.0	32.36		32.1
June 8.4	54.37	.01	76.9	39.53	.00	20.5	34.66	.03	41.4	4.17	.04	62.3	32.02	.34	35.1
18.4	54.32	.05	79.0	39.49	.04	22.6	34.66	.00	42.7	4.17	.00	63.6	31.51	.51	37.8
28.4	54.24	.08	80.9	39.43	.06	24.5	34.62	.04	43.9	4.14	.03	64.7	30.86	.65	40.2
July 8.4	54.14	.10	82.5	39.33	.10	26.1	34.56	.06	45.1	4.09	.05	65.8	30.08	.78	42.2
		.14	1.4		.13	1.3		.08	1.0		.09	1.0		0.88	1.6
18.3	54.00		83.9	39.20		27.4	34.48		46.1	4.00		66.8	29.20		43.8
28.3	53.84	.16	84.9	39.05	.15	28.5	34.36	.12	46.9	3.89	.11	67.6	28.22	.98	44.8
Aug. 7.3	53.66	.18	85.6	38.88	.17	29.2	34.22	.14	47.6	3.75	.14	68.2	27.19	1.03	45.4
17.3	53.47	.19	85.8	38.70	.18	29.6	34.07	.15	48.0	3.60	.15	68.7	26.11	1.08	45.4
27.2	53.27	.20	85.8	38.50	.20	29.6	33.90	.17	48.3	3.44	.16	69.0	25.02	1.09	44.9
		.20	0.5		.20	0.4		.17	0.1		.17	0.1		1.09	1.0
Sept. 6.2	53.07		85.3	38.30		29.2	33.73		48.4	3.27		69.1	23.93		43.9
16.2	52.88	.19	84.5	38.12	.18	28.5	33.57	.16	48.2	3.10	.17	69.0	22.88	1.05	42.4
26.1	52.71	.17	83.2	37.95	.17	27.4	33.42	.15	47.8	2.96	.14	68.7	21.90	.98	40.4
Oct. 6.1	52.56	.15	81.6	37.80	.15	25.9	33.30	.12	47.2	2.83	.13	68.2	21.00	.90	38.0
16.1	52.45	.11	79.7	37.69	.11	24.1	33.20	.10	46.3	2.73	.10	67.4	20.22	.78	35.2
		.07	2.3		.07	2.1		.05	1.1		.06	1.0		0.65	3.1
26.1	52.38		77.4	37.62		22.0	33.15		45.2	2.67		66.4	19.57		32.1
Nov. 5.0	52.36	.02	74.9	37.60	.02	19.5	33.14	.01	43.8	2.65	.02	65.2	19.09	.48	28.6
15.0	52.40	.04	72.1	37.63	.03	16.9	33.17	.03	42.2	2.68	.03	63.7	18.79	.30	25.0
25.0	52.49	.09	69.2	37.71	.08	14.0	33.26	.09	40.4	2.76	.08	62.0	18.68	.11	21.3
Dec. 5.0	52.63	.14	66.1	37.84	.13	11.1	33.40	.14	38.4	2.89	.13	60.2	18.77	.09	17.5
		.19	3.1		.19	3.0		.18	2.0		.18	2.0		0.29	3.7
14.9	52.82		63.0	38.03		8.1	33.58		36.4	3.07		58.2	19.06		13.8
24.9	53.06	.24	60.1	38.26	.23	5.2	33.80	.22	34.2	3.29	.22	56.1	19.54	.48	10.4
34.9	53.34	.28	57.2	38.53	.27	2.4	34.05	.25	32.1	3.54	.25	54.1	20.21	0.67	7.3



# FIXED STARS, 1904.

373

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Coronæ Borealis.		δ Scorpïi.		β¹ Scorpïi.		φ Herculis.		δ¹ Apodis.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.
	h m 15 53	° +27 9	h m 15 54	° -22 20	h m 15 59	° -19 32	h m 16 5	° +45 10	h m 16 5	° -78 26
	s	"	s	"	s	"	s	"	s	"
Jan. 0.9	35.45	20.9	38.38	43.6	50.23	23.2	42.89	69.7	55.13	55.9
10.9	35.72	18.2	38.67	44.5	50.51	24.2	43.18	66.6	56.19	54.3
20.8	36.01	15.8	38.98	45.4	50.81	25.2	43.50	63.9	57.36	53.1
30.8	36.32	13.8	39.31	46.5	51.13	26.3	43.86	61.7	58.61	52.4
Feb. 9.8	36.64	12.2	39.63	47.6	51.45	27.5	44.23	60.0	59.91	52.2
19.8	36.96	11.0	39.96	48.7	51.77	28.6	44.60	58.9	61.24	52.5
29.8	37.27	10.4	40.27	49.8	52.08	29.6	44.98	58.4	62.54	53.3
Mar. 10.7	37.56	10.4	40.57	50.8	52.38	30.5	45.33	58.6	63.81	54.5
20.7	37.84	10.8	40.86	51.7	52.66	31.3	45.67	59.4	65.02	56.1
30.6	38.09	11.7	41.12	52.5	52.92	32.0	45.97	60.7	66.14	58.1
Apr. 9.6	38.31	13.1	41.35	53.2	53.15	32.6	46.25	62.6	67.16	60.4
19.6	38.50	14.8	41.56	53.8	53.36	33.0	46.48	64.8	68.05	63.0
29.6	38.66	16.8	41.75	54.3	53.55	33.3	46.66	67.4	68.80	65.8
May 9.5	38.79	19.0	41.90	54.7	53.70	33.6	46.81	70.2	69.41	68.7
19.5	38.88	21.3	42.03	55.0	53.83	33.7	46.90	73.2	69.85	71.7
29.5	38.93	23.7	42.12	55.3	53.93	33.8	46.96	76.2	70.13	74.7
June 8.5	38.95	26.0	42.18	55.6	53.99	33.8	46.96	79.0	70.23	77.7
18.4	38.94	28.2	42.20	55.7	54.02	33.8	46.91	81.8	70.15	80.6
28.4	38.89	30.2	42.19	55.8	54.01	33.8	46.82	84.3	69.89	83.3
July 8.4	38.80	32.0	42.14	55.8	53.97	33.7	46.69	86.5	69.47	85.7
18.3	38.69	33.5	42.06	55.8	53.89	33.6	46.52	88.4	68.90	87.8
28.3	38.54	34.7	41.95	55.7	53.78	33.4	46.31	89.9	68.18	89.4
Aug. 7.3	38.38	35.6	41.81	55.5	53.65	33.1	46.07	90.9	67.35	90.7
17.3	38.19	36.2	41.65	55.2	53.50	32.8	45.81	91.6	66.43	91.4
27.2	37.99	36.3	41.48	54.9	53.32	32.5	45.54	91.7	65.46	91.6
Sept. 6.2	37.79	36.1	41.30	54.5	53.15	32.1	45.26	91.4	64.47	91.3
16.2	37.59	35.6	41.12	54.0	52.97	31.7	44.98	90.6	63.51	90.4
26.2	37.40	34.6	40.96	53.5	52.81	31.3	44.72	89.3	62.61	89.0
Oct. 6.1	37.24	33.3	40.82	53.0	52.67	30.9	44.48	87.6	61.81	87.2
16.1	37.10	31.6	40.71	52.5	52.56	30.6	44.28	85.4	61.16	84.9
26.1	37.01	29.6	40.65	52.1	52.49	30.3	44.12	82.9	60.68	82.4
Nov. 5.0	36.96	27.3	40.63	51.8	52.47	30.2	44.01	80.0	60.40	79.6
15.0	36.96	24.7	40.67	51.6	52.50	30.2	43.97	76.8	60.34	76.6
25.0	37.02	21.9	40.76	51.6	52.59	30.4	43.98	73.4	60.50	73.7
Dec. 5.0	37.13	19.0	40.90	51.8	52.72	30.7	44.07	69.9	60.88	70.9
14.9	37.29	16.0	41.09	52.2	52.91	31.3	44.21	66.4	61.48	68.3
24.9	37.50	13.0	41.33	52.8	53.13	32.0	44.42	63.0	62.27	66.0
34.9	37.75	10.2	41.60	53.6	53.40	32.9	44.68	59.7	63.23	64.2

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	Groombridge 2320.			δ Ophiuchi.			σ Coronæ Borealis.			τ Herculis.			γ Apodis.		
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion South.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion South.	
	h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "	
	16 5	+68 3		16 9	- 3 26		16 11	+34 5		16 16	+46 32		16 18	-78 40	
Jan. 0.9	59.85	43.0	17.81	42.8	3.51	67.0	49.43	29.5	38.34	36.2					
10.9	60.28	39.9	18.06	44.4	3.77	64.1	49.71	26.4	39.37	34.4					
20.9	60.79	37.2	18.34	46.0	4.06	61.5	50.02	23.6	40.53	33.0					
30.8	61.37	35.1	18.64	47.5	4.38	59.3	50.38	21.3	41.78	32.1					
Feb. 9.8	61.98	33.5	18.94	48.9	4.70	57.5	50.75	19.5	43.10	31.7					
19.8	62.63	32.6	19.24	50.0	5.03	56.3	51.13	18.3	44.45	31.8					
29.8	63.26	32.4	19.53	51.0	5.36	55.7	51.51	17.8	45.79	32.3					
Mar. 10.7	63.89	32.9	19.81	51.6	5.68	55.6	51.88	17.8	47.10	33.4					
20.7	64.46	34.0	20.07	52.0	5.98	56.1	52.22	18.5	48.36	34.8					
30.7	64.99	35.8	20.32	52.1	6.25	57.2	52.54	19.8	49.53	36.6					
Apr. 9.6	65.44	38.0	20.55	51.9	6.50	58.7	52.83	21.6	50.61	38.8					
19.6	65.82	40.7	20.75	51.6	6.71	60.6	53.08	23.8	51.57	41.2					
29.6	66.10	43.6	20.93	51.0	6.89	62.8	53.28	26.4	52.40	43.9					
May 9.5	66.28	46.8	21.08	50.3	7.04	65.3	53.44	29.2	53.07	46.7					
19.5	66.38	50.1	21.20	49.5	7.14	67.9	53.55	32.2	53.58	49.7					
29.5	66.37	53.3	21.30	48.6	7.21	70.5	53.62	35.2	53.92	52.7					
June 8.5	66.27	56.5	21.36	47.8	7.24	73.1	53.63	38.2	54.08	55.7					
18.4	66.08	59.4	21.39	46.8	7.22	75.6	53.59	41.0	54.06	58.6					
28.4	65.80	62.1	21.38	46.0	7.17	78.0	53.51	43.7	53.86	61.3					
July 8.4	65.44	64.4	21.35	45.2	7.08	80.0	53.38	46.0	53.48	63.8					
18.4	65.02	66.3	21.28	44.4	6.96	81.8	53.21	48.0	52.93	66.0					
28.4	64.54	67.7	21.18	43.8	6.80	83.3	53.00	49.6	52.24	67.8					
Aug. 7.3	64.01	68.7	21.05	43.2	6.62	84.3	52.76	50.8	51.41	69.2					
17.3	63.44	69.1	20.91	42.8	6.41	85.0	52.49	51.5	50.49	70.1					
27.3	62.86	69.0	20.74	42.4	6.19	85.3	52.20	51.8	49.51	70.5					
Sept. 6.2	62.28	68.4	20.57	42.2	5.96	85.2	51.91	51.6	48.50	70.3					
16.2	61.70	67.3	20.40	42.1	5.73	84.6	51.62	50.9	47.50	69.6					
26.2	61.15	65.6	20.24	42.2	5.51	83.6	51.34	49.7	46.55	68.4					
Oct. 6.1	60.65	63.6	20.10	42.4	5.32	82.2	51.09	48.0	45.70	66.7					
16.1	60.20	61.0	19.99	42.7	5.15	80.4	50.87	46.0	44.99	64.5					
26.1	59.83	58.1	19.92	43.3	5.02	78.2	50.69	43.5	44.45	62.0					
Nov. 5.1	59.55	54.8	19.88	44.0	4.94	75.8	50.56	40.7	44.10	59.3					
15.0	59.38	51.3	19.90	45.0	4.91	73.0	50.50	37.5	43.98	56.4					
25.0	59.31	47.6	19.96	46.1	4.94	70.0	50.50	34.1	44.08	53.5					
Dec. 5.0	59.35	43.8	20.07	47.4	5.02	66.8	50.56	30.6	44.41	50.6					
14.9	59.51	40.0	20.23	48.9	5.16	63.6	50.69	27.1	44.96	47.9					
24.9	59.79	36.4	20.43	50.5	5.36	60.4	50.88	23.6	45.71	45.5					
34.9	60.16	33.0	20.67	52.2	5.59	57.3	51.13	20.2	46.64	43.5					

(CONSTANTS OF STRUVE AND PETERS.)

375

### APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Ursæ Minoris.			γ Draconis.			α Scorpii. (Antares.)			β Herculis.			A Draconis.		
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion South.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.	
	h m 16 20	° ' " +75 58		h m 16 22	° ' " +61 43		h m 16 23	° ' " -26 12		h m 16 26	° ' " +21 41		h m 16 28	° ' " +68 58	
	s	"		s	"		s	"		s	"		s	"	
Jan.	0.9	12.28		38.51	51.2		30.10	56.8		4.24	57.9		6.15	31.4	
	10.9	12.84	-56	30.5	48.0	-34	30.38	57.3	-0.5	4.48	55.3	-2.6	6.54	28.1	
	20.9	13.54	-70	27.8	45.1	-40	30.69	57.9	-0.6	4.74	52.9	-2.4	7.03	25.2	
	30.8	14.34	-80	25.6	42.8	-46	31.01	58.6	-0.7	5.03	50.8	-2.1	7.59	22.9	
Feb.	9.8	15.23	-93	24.0	41.0	-51	31.34	59.4	-0.9	5.33	49.1	-1.7	8.21	21.1	
				1.0	1.2						1.3		1.2	1.8	
	19.8	16.16		23.0	39.8		31.67	60.3		5.63	47.8		8.86	19.9	
	29.8	17.12	-96	22.7	39.4	-52	32.00	61.1	-0.8	5.93	47.0	-0.8	9.52	19.4	
Mar.	10.7	18.05	-93	23.1	39.6	-51	32.32	62.0	-0.9	6.23	46.7	-0.3	10.17	19.6	
	20.7	18.94	-89	24.1	40.4	-48	32.62	62.8	-0.8	6.51	46.8	-0.1	10.80	20.5	
	30.7	19.74	-80	25.8	41.9	-44	32.91	63.5	-0.7	6.77	47.5	-0.7	11.37	22.0	
			-71	2.1	2.5	-40		0.7			1.0		1.5	2.0	
Apr.	9.6	20.45		27.9	43.9		33.17	64.2		7.01	48.5		11.88	24.0	
	19.6	21.03	-58	30.5	46.4	-33	33.41	64.8	-0.6	7.22	50.0	-1.5	12.31	26.5	
	29.6	21.47	-44	33.4	49.2	-27	33.63	65.3	-0.5	7.41	51.7	-1.7	12.65	29.4	
May	9.6	21.77	-30	36.6	52.3	-20	33.82	65.9	-0.6	7.57	53.7	-2.0	12.90	32.5	
	19.5	21.91	-14	39.8	55.5	-12	33.98	66.3	-0.4	7.70	55.8	-2.1	13.04	35.8	
			-01	3.3	3.3	-05		0.5		0.9	2.2		0.5	3.3	
	29.5	21.90		43.1	58.8		34.10	66.8		7.79	58.0		13.09	39.1	
June	8.5	21.73	-17	46.3	62.0	-03	34.19	67.1	-0.3	7.85	60.2	-2.2	13.03	42.3	
	18.5	21.42	-31	49.3	65.0	-09	34.25	67.5	-0.4	7.87	62.4	-2.0	12.87	45.4	
	28.4	20.98	-44	52.0	67.8	-17	34.26	67.8	-0.3	7.85	64.4	-1.8	12.62	48.2	
July	8.4	20.40	-58	54.4	70.3	-29	34.23	68.0	-0.2	7.80	66.2	-1.6	12.28	50.7	
			-68	2.0	2.1	-29		0.2		0.8	1.6		1.4	2.2	
	18.4	19.72		56.4	72.4		34.17	68.2		7.72	67.8		11.87	52.9	
	28.4	18.95	-77	57.9	74.1	-35	34.07	68.3	-0.1	7.60	69.1	-1.3	11.39	54.6	
Aug.	7.3	18.10	-85	59.0	75.3	-39	33.94	68.4	-0.1	7.45	70.2	-1.1	10.85	55.8	
	17.3	17.20	-90	59.5	76.0	-42	33.78	68.3	-0.2	7.28	71.0	-0.8	10.26	56.6	
	27.3	16.26	-95	59.6	76.3	-46	33.60	68.1	-0.3	7.10	71.4	-0.1	9.65	56.8	
				0.5	0.3	-46		0.3		0.20	0.1		0.62	0.3	
Sept.	6.2	15.31		59.1	76.0		33.41	67.8		6.90	71.5		9.03	56.5	
	16.2	14.37	-94	58.1	75.2	-45	33.22	67.4	-0.4	6.70	71.3	-0.2	8.41	55.7	
	26.2	13.47	-90	56.6	73.8	-44	33.04	66.9	-0.5	6.51	70.7	-0.6	7.81	54.4	
Oct.	6.2	12.63	-76	54.7	72.0	-36	32.88	66.4	-0.5	6.34	69.7	-1.3	7.24	52.6	
	16.1	11.87	-66	52.3	69.7	-30	32.75	65.8	-0.5	6.19	68.4	-1.6	6.73	50.3	
				2.8	2.7	-30				0.12	1.6		0.43	2.7	
	26.1	11.21		49.5	67.0		32.65	65.3		6.07	66.8		6.30	47.6	
Nov.	5.1	10.68	-53	46.3	64.0	-24	32.61	64.8	-0.5	6.00	64.9	-1.9	5.95	44.5	
	15.0	10.31	-37	42.9	60.6	-15	32.61	64.4	-0.3	5.98	62.7	-2.2	5.70	41.1	
	25.0	10.09	-22	39.2	57.0	-07	32.68	64.1	-0.1	6.00	60.2	-2.5	5.56	37.5	
Dec.	5.0	10.04	-13	35.5	53.2	-11	32.79	64.0	-0.0	6.08	57.6	-2.8	5.54	33.7	
				3.7	3.7	-11				0.13	2.8		1.1	3.7	
	15.0	10.17		31.8	49.5		32.96	64.0		6.21	54.8		5.65	30.0	
	24.9	10.46	-29	28.2	45.8	-21	33.18	64.2	-0.2	6.38	52.1	-2.7	5.86	26.3	
	34.9	10.93	-17	24.8	42.3	-29	33.44	64.6	-0.4	6.60	49.4	-2.7	6.20	22.8	

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	♏ Ophiuchi.		♐ Triang. Australis.		♑ Herculis.		♒ Ophiuchi.		♓ Ursæ Minoris.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 16 31	° ' " -10 22	h m 16 38	° ' " -68 50	h m 16 39	° ' " +39 6	h m 16 53	° ' " +9 31	h m 16 55	° ' " +82 11
Jan. 0.9	51.21 s	13.1 "	27.03 s	48.9 "	34.59 s	18.1 "	6.20 s	32.6 "	36.51 s	46.2 "
10.9	51.46 .25	14.3 1.2	27.60 .57	47.2 1.7	34.82 .23	15.0 3.1	6.42 .22	30.5 2.1	37.20 0.69	42.9 3.3
20.9	51.73 .27	15.5 1.2	28.24 .64	45.9 1.3	35.10 .28	12.2 2.8	6.66 .24	28.5 2.0	38.16 0.96	40.0 2.9
30.8	52.02 .29	16.7 1.2	28.94 .70	45.0 0.9	35.41 .31	9.7 2.5	6.93 .27	26.7 1.8	39.36 1.20	37.5 2.5
Feb. 9.8	52.32 .30	17.9 1.2	29.67 .73	44.5 0.5	35.74 .33	7.8 1.9	7.21 .28	25.1 1.6	40.76 1.40	35.5 2.0
	52.32 .30	17.9 1.0	29.67 .76	44.5 0.1	35.74 .34	7.8 1.4	7.21 .29	25.1 1.2	40.76 1.54	35.5 1.4
19.8	52.62 .30	18.9 0.9	30.43 .76	44.4 0.4	36.08 .34	6.4 0.9	7.50 .29	23.9 0.9	42.30 1.62	34.1 0.7
29.8	52.92 .29	19.8 0.6	31.19 .75	44.8 0.7	36.42 .34	5.5 0.2	7.79 .28	23.0 0.5	43.92 1.64	33.4 0.1
Mar. 10.7	53.21 .28	20.4 0.5	31.94 .72	45.5 1.1	36.76 .33	5.3 0.4	8.07 .27	22.5 0.1	45.56 1.60	33.3 0.6
20.7	53.49 .27	20.9 0.2	32.66 .68	46.6 1.5	37.09 .30	5.7 0.9	8.35 .27	22.4 0.2	47.16 1.51	33.9 1.2
30.7	53.76 .24	21.1 0.1	33.34 .65	48.1 1.7	37.39 .28	6.6 1.5	8.62 .25	22.6 0.7	48.67 1.36	35.1 1.8
Apr. 9.7	54.00 .23	21.2 0.1	33.99 .58	49.8 2.0	37.67 .25	8.1 1.9	8.87 .23	23.3 1.0	50.03 1.17	36.9 2.2
19.6	54.23 .20	21.1 0.3	34.57 .52	51.8 2.2	37.92 .22	10.0 2.3	9.10 .20	24.3 1.2	51.20 0.95	39.1 2.7
29.6	54.43 .18	20.8 0.4	35.09 .44	54.0 2.4	38.14 .18	12.3 2.6	9.30 .19	25.5 1.4	52.15 0.69	41.8 2.9
May 9.6	54.61 .15	20.4 0.5	35.53 .37	56.4 2.5	38.32 .14	14.9 2.8	9.49 .15	26.9 1.6	52.84 0.41	44.7 3.2
19.5	54.76 .12	19.9 0.5	35.90 .27	58.9 2.6	38.46 .09	17.7 2.9	9.64 .13	28.5 1.7	53.25 0.14	47.9 3.2
29.5	54.88 .09	19.4 0.6	36.17 .17	61.5 2.6	38.55 .05	20.6 2.8	9.77 .09	30.2 1.7	53.39 0.14	51.1 3.2
June 8.5	54.97 .05	18.8 0.6	36.34 .08	64.1 2.5	38.60 .01	23.4 2.8	9.86 .06	31.9 1.7	53.25 0.42	54.3 3.1
18.5	55.02 .02	18.2 0.5	36.42 .02	66.6 2.4	38.61 .03	26.2 2.6	9.92 .02	33.6 1.6	52.83 0.68	57.4 2.9
28.5	55.04 .02	17.7 0.5	36.40 .12	69.0 2.3	38.58 .08	28.8 2.4	9.94 .02	35.2 1.5	52.15 0.93	60.3 2.6
July 8.4	55.02 .05	17.2 0.5	36.28 .22	71.3 2.0	38.50 .12	31.2 2.1	9.92 .05	36.7 1.3	51.22 1.14	62.9 2.3
18.4	54.97 .09	16.7 0.4	36.06 .31	73.3 1.7	38.38 .16	33.3 1.7	9.87 .08	38.0 1.2	50.08 1.33	65.2 2.0
28.4	54.88 .12	16.3 0.4	35.75 .39	75.0 1.4	38.22 .20	35.0 1.4	9.79 .12	39.2 1.0	48.75 1.49	67.2 1.4
Aug. 7.3	54.76 .14	15.9 0.4	35.36 .45	76.4 0.9	38.02 .22	36.4 1.0	9.67 .14	40.2 0.7	47.26 1.62	68.6 1.0
17.3	54.62 .16	15.5 0.3	34.91 .50	77.3 0.5	37.80 .24	37.4 0.5	9.53 .17	40.9 0.5	45.64 1.72	69.6 0.6
27.3	54.46 .18	15.2 0.3	34.41 .53	77.8 0.0	37.56 .25	37.9 0.1	9.36 .18	41.4 0.3	43.92 1.76	70.2 0.0
Sept. 6.2	54.28 .17	14.9 0.2	33.88 .53	77.8 0.4	37.31 .26	38.0 0.3	9.18 .19	41.7 0.0	42.16 1.77	70.2 0.5
16.2	54.11 .17	14.7 0.1	33.35 .51	77.4 0.9	37.05 .25	37.7 0.8	8.99 .18	41.7 0.2	40.39 1.75	69.7 1.0
26.2	53.94 .15	14.6 0.0	32.84 .47	76.5 1.4	36.80 .23	36.9 1.3	8.81 .17	41.5 0.5	38.64 1.68	68.7 1.4
Oct. 6.2	53.79 .13	14.6 0.1	32.37 .40	75.1 1.8	36.57 .21	35.6 1.7	8.64 .15	41.0 0.8	36.96 1.56	67.3 1.9
16.1	53.66 .09	14.7 0.2	31.97 .31	73.3 2.1	36.36 .17	33.9 2.1	8.49 .12	40.2 1.0	35.40 1.41	65.4 2.4
26.1	53.57 .05	14.9 0.4	31.66 .20	71.2 2.3	36.19 .12	31.8 2.5	8.37 .08	39.2 1.3	33.99 1.21	63.0 2.8
Nov. 5.1	53.52 .01	15.3 0.5	31.46 .09	68.9 2.5	36.07 .08	29.3 2.8	8.29 .03	37.9 1.5	32.78 0.98	60.2 3.1
15.1	53.51 .05	15.8 0.7	31.37 .03	66.4 2.6	35.99 .01	26.5 3.0	8.26 .01	36.4 1.7	31.80 0.72	57.1 3.4
25.0	53.56 .09	16.5 0.8	31.40 .17	63.8 2.5	35.98 .04	23.5 3.3	8.27 .06	34.7 2.0	31.08 0.42	53.7 3.5
Dec. 5.0	53.65 .15	17.3 1.0	31.57 .30	61.3 2.4	36.02 .10	20.2 3.3	8.33 .11	32.7 2.1	30.66 0.12	50.2 3.6
15.0	53.80 .19	18.3 1.1	31.87 .40	58.9 2.2	36.12 .16	16.9 3.4	8.44 .15	30.6 2.1	30.54 0.20	46.6 3.6
24.9	53.99 .22	19.4 1.2	32.27 .51	56.7 1.9	36.28 .21	13.5 3.2	8.59 .19	28.5 2.2	30.74 0.50	43.0 3.6
34.9	54.21	20.6	32.78	54.8	36.49	10.3	8.78	26.3	31.24	39.6

# FIXED STARS, 1904.

377

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	<i>d</i> Herculis.			<i>ε</i> Ophiuchi.			<i>α</i> Herculis.			<i>π</i> Herculis.			<i>θ</i> Ophiuchi.		
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion South.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion South.	
	h m	°		h m	°		h m	°		h m	°		h m	°	
	16 58	+33 42		17 4	-15 36		17 10	+14 29		17 11	+36 54		17 16	-24 54	
	s	"		s	"		s	"		s	"		s	"	
Jan. 0.9	2.10	.21	28.4	51.07	.23	12.5	14.89	.20	64.1	.20	65.4	5.48	.24	3.3	.02
10.9	2.31	.25	25.4	51.30	.26	13.3	15.09	.23	61.8	.22	62.3	5.72	.26	3.5	.03
20.9	2.56	.29	22.7	51.56	.28	14.2	15.32	.26	59.6	.19	60.9	5.98	.28	3.8	.04
30.9	2.85	.30	20.2	51.84	.29	15.0	15.58	.27	57.7	.17	58.8	6.26	.31	4.2	.05
Feb. 9.8	3.15	.32	18.2	52.13	.30	15.8	15.85	.29	56.0	.14	57.1	6.57	.32	4.7	.04
19.8	3.47	.32	16.7	52.43	.31	16.6	16.14	.29	54.6	.09	55.1	6.89	.32	5.1	.05
29.8	3.79	.32	15.7	52.74	.30	17.3	16.43	.29	53.7	.06	54.0	7.21	.32	5.6	.04
Mar. 10.8	4.11	.32	15.3	53.04	.29	17.8	16.72	.28	53.1	.01	53.5	7.53	.31	6.0	.04
20.7	4.43	.29	15.5	53.33	.29	18.2	17.00	.28	53.0	.04	53.6	7.84	.31	6.4	.03
30.7	4.72	.28	16.2	53.62	.27	18.4	17.28	.26	53.4	.08	54.3	8.15	.29	6.7	.02
Apr. 9.7	5.00	.26	17.4	53.89	.25	18.5	17.54	.24	54.2	.11	54.5	8.44	.28	6.9	.03
19.6	5.26	.22	19.1	54.14	.23	18.4	17.78	.22	55.3	.14	55.2	8.72	.26	7.2	.01
29.6	5.48	.19	21.2	54.37	.21	18.2	18.00	.20	56.7	.17	57.3	8.98	.23	7.3	.02
May 9.6	5.67	.16	23.6	54.58	.19	18.0	18.20	.16	58.4	.18	59.8	9.21	.21	7.5	.01
19.6	5.83	.12	26.2	54.77	.15	17.7	18.36	.14	60.2	.20	62.5	9.42	.18	7.6	.02
29.5	5.95	.08	28.9	54.92	.13	17.3	18.50	.11	62.2	.20	65.3	9.60	.14	7.8	.02
June 8.5	6.03	.04	31.7	55.05	.09	17.0	18.61	.07	64.2	.19	68.2	9.74	.10	8.0	.02
18.5	6.07	.01	34.4	55.14	.05	16.6	18.68	.03	66.1	.19	71.0	9.84	.07	8.2	.02
28.5	6.06	.05	36.9	55.19	.01	16.3	18.71	.01	68.0	.18	73.7	9.91	.02	8.4	.02
July 8.4	6.01	.09	39.3	55.20	.03	16.0	18.70	.04	69.8	.16	76.3	9.93	.02	8.6	.02
18.4	5.92	.13	41.4	55.17	.07	15.8	18.66	.08	71.4	.14	78.6	9.91	.06	8.8	.02
28.4	5.79	.16	43.2	55.10	.10	15.6	18.58	.11	72.8	.12	80.6	9.85	.10	9.0	.01
Aug. 7.3	5.63	.19	44.7	55.00	.13	15.4	18.47	.15	74.0	.09	82.2	9.75	.14	9.1	.01
17.3	5.44	.22	45.8	54.87	.16	15.2	18.32	.16	74.9	.06	83.5	9.61	.16	9.2	.01
27.3	5.22	.23	46.6	54.71	.18	15.0	18.16	.19	75.5	.04	84.4	9.45	.18	9.3	.01
Sept. 6.3	4.99	.24	46.9	54.53	.18	14.8	17.97	.19	75.9	.01	84.8	9.27	.20	9.2	.01
16.2	4.75	.24	46.8	54.35	.18	14.7	17.78	.19	76.0	.03	84.8	9.07	.19	9.1	.02
26.2	4.51	.22	46.2	54.17	.17	14.5	17.59	.19	75.7	.05	84.3	8.88	.19	8.9	.02
Oct. 6.2	4.29	.20	45.2	54.00	.15	14.4	17.40	.16	75.2	.08	83.4	8.69	.16	8.7	.03
16.2	4.09	.16	43.8	53.85	.12	14.3	17.24	.13	74.4	.11	82.1	8.53	.13	8.4	.04
26.1	3.93	.13	42.0	53.73	.08	14.3	17.11	.10	73.3	.15	80.3	8.40	.09	8.0	.03
Nov. 5.1	3.80	.08	39.9	53.65	.03	14.4	17.01	.06	71.8	.17	78.2	8.31	.05	7.7	.03
15.1	3.72	.03	37.4	53.62	.02	14.6	16.95	.01	70.1	.19	75.7	8.26	.01	7.4	.03
25.0	3.69	.03	34.6	53.64	.07	14.9	16.94	.04	68.2	.21	72.8	8.27	.06	7.1	.01
Dec. 5.0	3.72	.09	31.6	53.71	.11	15.3	16.98	.09	66.1	.23	69.8	8.33	.12	7.0	.01
15.0	3.81	.13	28.4	53.82	.16	15.9	17.07	.13	63.8	.24	66.6	8.45	.16	6.9	.01
25.0	3.94	.19	25.2	53.98	.21	16.6	17.20	.18	61.4	.23	63.3	8.61	.21	7.0	.02
34.9	4.13		22.1	54.19		17.4	17.38		59.1		60.1	8.82		7.2	

# FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\delta$ Ophiuchi.			$\delta$ Ara.			$\beta$ Draconis.			$\alpha$ Ophiuchi.			$\epsilon$ Herculis.		
	Right Ascension.	Declina- tion South.		Right Ascension.	Declina- tion South.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.	
	h m	°		h m	°		h m	°		h m	°		h m	°	
	17 20	-24 5		17 22	-60 35		17 28	+52 22		17 30	+12 37		17 36	+46 3	
	s	"		s	"		s	"		s	"		s	"	
Jan. 1.0	29.07 <sub>.23</sub>	3.6 <sub>0.2</sub>		23.44 <sub>.37</sub>	61.0 <sub>1.7</sub>		13.57 <sub>.19</sub>	24.3 <sub>3.5</sub>		27.37 <sub>.18</sub>	53.4 <sub>2.2</sub>		43.38 <sub>.18</sub>	31.0 <sub>3.4</sub>	
10.9	29.30 <sub>.26</sub>	3.8 <sub>0.4</sub>		23.81 <sub>.43</sub>	59.3 <sub>1.5</sub>		13.76 <sub>.26</sub>	20.8 <sub>3.2</sub>		27.55 <sub>.21</sub>	51.2 <sub>2.1</sub>		43.56 <sub>.23</sub>	27.6 <sub>3.2</sub>	
20.9	29.56 <sub>.28</sub>	4.2 <sub>0.4</sub>		24.24 <sub>.49</sub>	57.8 <sub>1.1</sub>		14.02 <sub>.30</sub>	17.6 <sub>2.9</sub>		27.76 <sub>.25</sub>	49.1 <sub>1.9</sub>		43.79 <sub>.27</sub>	24.4 <sub>2.8</sub>	
30.9	29.84 <sub>.30</sub>	4.6 <sub>0.4</sub>		24.73 <sub>.52</sub>	56.7 <sub>0.9</sub>		14.32 <sub>.35</sub>	14.7 <sub>2.4</sub>		28.01 <sub>.26</sub>	47.2 <sub>1.7</sub>		44.06 <sub>.31</sub>	21.6 <sub>2.4</sub>	
Feb. 9.8	30.14 <sub>.31</sub>	5.0 <sub>0.5</sub>		25.25 <sub>.55</sub>	55.8 <sub>0.5</sub>		14.67 <sub>.38</sub>	12.3 <sub>1.9</sub>		28.27 <sub>.27</sub>	45.5 <sub>1.4</sub>		44.37 <sub>.34</sub>	19.2 <sub>1.9</sub>	
19.8	30.45 <sub>.32</sub>	5.5 <sub>0.4</sub>		25.80 <sub>.56</sub>	55.3 <sub>0.2</sub>		15.05 <sub>.40</sub>	10.4 <sub>1.2</sub>		28.54 <sub>.29</sub>	44.1 <sub>1.0</sub>		44.71 <sub>.35</sub>	17.3 <sub>1.4</sub>	
29.8	30.77 <sub>.32</sub>	5.9 <sub>0.4</sub>		26.36 <sub>.57</sub>	55.1 <sub>0.1</sub>		15.45 <sub>.41</sub>	9.2 <sub>0.7</sub>		28.83 <sub>.29</sub>	43.1 <sub>0.6</sub>		45.06 <sub>.37</sub>	15.9 <sub>0.7</sub>	
Mar. 10.8	31.09 <sub>.32</sub>	6.3 <sub>0.4</sub>		26.93 <sub>.56</sub>	55.2 <sub>0.4</sub>		15.86 <sub>.40</sub>	8.5 <sub>0.1</sub>		29.12 <sub>.28</sub>	42.5 <sub>0.1</sub>		45.43 <sub>.36</sub>	15.2 <sub>0.0</sub>	
20.7	31.41 <sub>.30</sub>	6.7 <sub>0.2</sub>		27.49 <sub>.55</sub>	55.6 <sub>0.7</sub>		16.26 <sub>.40</sub>	8.6 <sub>0.7</sub>		29.40 <sub>.28</sub>	42.4 <sub>0.3</sub>		45.79 <sub>.36</sub>	15.2 <sub>0.5</sub>	
30.7	31.71 <sub>.29</sub>	6.9 <sub>0.3</sub>		28.04 <sub>.54</sub>	56.3 <sub>1.0</sub>		16.66 <sub>.37</sub>	9.3 <sub>1.3</sub>		29.68 <sub>.27</sub>	42.7 <sub>0.7</sub>		46.15 <sub>.35</sub>	15.7 <sub>1.2</sub>	
Apr. 9.7	32.00 <sub>.28</sub>	7.2 <sub>0.1</sub>		28.56 <sub>.50</sub>	57.3 <sub>1.2</sub>		17.03 <sub>.34</sub>	10.6 <sub>1.8</sub>		29.95 <sub>.25</sub>	43.4 <sub>1.0</sub>		46.50 <sub>.32</sub>	16.9 <sub>1.7</sub>	
19.7	32.28 <sub>.26</sub>	7.3 <sub>0.1</sub>		29.06 <sub>.46</sub>	58.5 <sub>1.5</sub>		17.37 <sub>.31</sub>	12.4 <sub>2.3</sub>		30.20 <sub>.23</sub>	44.4 <sub>1.3</sub>		46.82 <sub>.28</sub>	18.6 <sub>2.1</sub>	
29.6	32.54 <sub>.24</sub>	7.4 <sub>0.1</sub>		29.52 <sub>.41</sub>	60.0 <sub>1.7</sub>		17.68 <sub>.26</sub>	14.7 <sub>2.7</sub>		30.43 <sub>.22</sub>	45.7 <sub>1.6</sub>		47.10 <sub>.26</sub>	20.7 <sub>2.6</sub>	
May 9.6	32.78 <sub>.21</sub>	7.5 <sub>0.1</sub>		29.93 <sub>.36</sub>	61.7 <sub>1.9</sub>		17.94 <sub>.22</sub>	17.4 <sub>3.0</sub>		30.65 <sub>.18</sub>	47.3 <sub>1.8</sub>		47.36 <sub>.21</sub>	23.3 <sub>2.8</sub>	
19.6	32.99 <sub>.18</sub>	7.6 <sub>0.1</sub>		30.29 <sub>.30</sub>	63.6 <sub>2.0</sub>		18.16 <sub>.16</sub>	20.4 <sub>3.1</sub>		30.83 <sub>.16</sub>	49.1 <sub>1.9</sub>		47.57 <sub>.16</sub>	26.1 <sub>3.1</sub>	
29.5	33.17 <sub>.14</sub>	7.7 <sub>0.1</sub>		30.59 <sub>.23</sub>	65.6 <sub>2.1</sub>		18.32 <sub>.10</sub>	23.5 <sub>3.3</sub>		30.99 <sub>.13</sub>	51.0 <sub>1.9</sub>		47.73 <sub>.12</sub>	29.2 <sub>3.1</sub>	
June 8.5	33.31 <sub>.11</sub>	7.8 <sub>0.1</sub>		30.82 <sub>.16</sub>	67.7 <sub>2.1</sub>		18.42 <sub>.04</sub>	26.8 <sub>3.2</sub>		31.12 <sub>.09</sub>	52.9 <sub>2.0</sub>		47.85 <sub>.06</sub>	32.3 <sub>3.2</sub>	
18.5	33.42 <sub>.07</sub>	7.9 <sub>0.2</sub>		30.98 <sub>.09</sub>	69.8 <sub>2.1</sub>		18.46 <sub>.02</sub>	30.0 <sub>3.2</sub>		31.21 <sub>.05</sub>	54.9 <sub>1.9</sub>		47.91 <sub>.01</sub>	35.5 <sub>3.0</sub>	
28.5	33.49 <sub>.03</sub>	8.1 <sub>0.1</sub>		31.07 <sub>.01</sub>	71.9 <sub>2.1</sub>		18.44 <sub>.07</sub>	33.2 <sub>2.9</sub>		31.26 <sub>.01</sub>	56.8 <sub>1.7</sub>		47.92 <sub>.04</sub>	38.5 <sub>2.9</sub>	
July 8.4	33.52 <sub>.02</sub>	8.2 <sub>0.2</sub>		31.08 <sub>.07</sub>	74.0 <sub>1.9</sub>		18.37 <sub>.14</sub>	36.1 <sub>2.7</sub>		31.27 <sub>.02</sub>	58.5 <sub>1.6</sub>		47.88 <sub>.09</sub>	41.4 <sub>2.7</sub>	
18.4	33.50 <sub>.06</sub>	8.4 <sub>0.2</sub>		31.01 <sub>.15</sub>	75.9 <sub>1.7</sub>		18.23 <sub>.19</sub>	38.8 <sub>2.4</sub>		31.25 <sub>.07</sub>	60.1 <sub>1.4</sub>		47.79 <sub>.15</sub>	44.1 <sub>2.4</sub>	
28.4	33.44 <sub>.09</sub>	8.6 <sub>0.1</sub>		30.86 <sub>.21</sub>	77.6 <sub>1.5</sub>		18.04 <sub>.23</sub>	41.2 <sub>2.0</sub>		31.18 <sub>.10</sub>	61.5 <sub>1.2</sub>		47.64 <sub>.19</sub>	46.5 <sub>2.0</sub>	
Aug. 7.4	33.35 <sub>.14</sub>	8.7 <sub>0.1</sub>		30.65 <sub>.28</sub>	79.1 <sub>1.2</sub>		17.81 <sub>.28</sub>	43.2 <sub>1.6</sub>		31.08 <sub>.13</sub>	62.7 <sub>1.0</sub>		47.45 <sub>.23</sub>	48.5 <sub>1.6</sub>	
17.3	33.21 <sub>.16</sub>	8.8 <sub>0.1</sub>		30.37 <sub>.33</sub>	80.3 <sub>0.9</sub>		17.53 <sub>.32</sub>	44.8 <sub>1.1</sub>		30.95 <sub>.16</sub>	63.7 <sub>0.7</sub>		47.22 <sub>.26</sub>	50.1 <sub>1.2</sub>	
27.3	33.05 <sub>.18</sub>	8.9 <sub>0.0</sub>		30.04 <sub>.36</sub>	81.2 <sub>0.5</sub>		17.21 <sub>.34</sub>	45.9 <sub>0.6</sub>		30.79 <sub>.17</sub>	64.4 <sub>0.4</sub>		46.96 <sub>.29</sub>	51.3 <sub>0.7</sub>	
Sept. 6.3	32.87 <sub>.19</sub>	8.9 <sub>0.1</sub>		29.68 <sub>.39</sub>	81.7 <sub>0.0</sub>		16.87 <sub>.35</sub>	46.5 <sub>0.2</sub>		30.62 <sub>.19</sub>	64.8 <sub>0.2</sub>		46.67 <sub>.30</sub>	52.0 <sub>0.3</sub>	
16.2	32.68 <sub>.20</sub>	8.8 <sub>0.2</sub>		29.29 <sub>.38</sub>	81.7 <sub>0.3</sub>		16.52 <sub>.36</sub>	46.7 <sub>0.4</sub>		30.43 <sub>.20</sub>	65.0 <sub>0.1</sub>		46.37 <sub>.31</sub>	52.3 <sub>0.2</sub>	
26.2	32.48 <sub>.18</sub>	8.6 <sub>0.2</sub>		28.91 <sub>.37</sub>	81.4 <sub>0.8</sub>		16.16 <sub>.35</sub>	46.3 <sub>0.8</sub>		30.23 <sub>.18</sub>	64.9 <sub>0.4</sub>		46.06 <sub>.30</sub>	52.1 <sub>0.7</sub>	
Oct. 6.2	32.30 <sub>.17</sub>	8.4 <sub>0.3</sub>		28.54 <sub>.33</sub>	80.6 <sub>1.2</sub>		15.81 <sub>.32</sub>	45.5 <sub>1.4</sub>		30.05 <sub>.17</sub>	64.5 <sub>0.7</sub>		45.76 <sub>.28</sub>	51.4 <sub>1.2</sub>	
16.2	32.13 <sub>.13</sub>	8.1 <sub>0.3</sub>		28.21 <sub>.28</sub>	79.4 <sub>1.5</sub>		15.49 <sub>.29</sub>	44.1 <sub>1.9</sub>		29.88 <sub>.15</sub>	63.8 <sub>1.0</sub>		45.48 <sub>.25</sub>	50.2 <sub>1.7</sub>	
26.1	32.00 <sub>.09</sub>	7.8 <sub>0.3</sub>		27.93 <sub>.21</sub>	77.9 <sub>1.8</sub>		15.20 <sub>.24</sub>	42.2 <sub>2.3</sub>		29.73 <sub>.11</sub>	62.8 <sub>1.2</sub>		45.23 <sub>.21</sub>	48.5 <sub>2.2</sub>	
Nov. 5.1	31.91 <sub>.05</sub>	7.5 <sub>0.2</sub>		27.72 <sub>.12</sub>	76.1 <sub>1.9</sub>		14.96 <sub>.19</sub>	39.9 <sub>2.7</sub>		29.62 <sub>.07</sub>	61.6 <sub>1.6</sub>		45.02 <sub>.16</sub>	46.3 <sub>2.5</sub>	
15.1	31.86 <sub>.00</sub>	7.3 <sub>0.2</sub>		27.60 <sub>.04</sub>	74.2 <sub>2.2</sub>		14.77 <sub>.13</sub>	37.2 <sub>3.1</sub>		29.55 <sub>.03</sub>	60.0 <sub>1.7</sub>		44.86 <sub>.11</sub>	43.8 <sub>2.9</sub>	
25.1	31.86 <sub>.06</sub>	7.1 <sub>0.1</sub>		27.56 <sub>.06</sub>	72.0 <sub>2.2</sub>		14.64 <sub>.06</sub>	34.1 <sub>3.4</sub>		29.52 <sub>.03</sub>	58.3 <sub>2.0</sub>		44.75 <sub>.05</sub>	40.9 <sub>3.2</sub>	
Dec. 5.0	31.92 <sub>.11</sub>	7.0 <sub>0.0</sub>		27.62 <sub>.15</sub>	69.8 <sub>2.1</sub>		14.58 <sub>.01</sub>	30.7 <sub>3.5</sub>		29.55 <sub>.07</sub>	56.3 <sub>2.2</sub>		44.70 <sub>.02</sub>	37.7 <sub>3.3</sub>	
15.0	32.03 <sub>.16</sub>	7.0 <sub>0.1</sub>		27.77 <sub>.24</sub>	67.7 <sub>2.0</sub>		14.59 <sub>.09</sub>	27.2 <sub>3.6</sub>		29.62 <sub>.11</sub>	54.1 <sub>2.2</sub>		44.72 <sub>.08</sub>	34.4 <sub>3.5</sub>	
25.0	32.19 <sub>.20</sub>	7.1 <sub>0.2</sub>		28.01 <sub>.33</sub>	65.7 <sub>1.9</sub>		14.68 <sub>.15</sub>	23.6 <sub>3.5</sub>		29.73 <sub>.16</sub>	51.9 <sub>2.3</sub>		44.80 <sub>.14</sub>	30.9 <sub>3.5</sub>	
34.9	32.39	7.3		28.34	63.8		14.83	20.1		29.89	49.6		44.94	27.4	

# FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

379

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\omega$ Draconis.		$\mu$ Herculis.		$\psi^1$ Draconis.		$\theta$ Herculis.		$\gamma$ Draconis.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 17 37	° ' " +68 47	h m 17 42	° ' " +27 46	h m 17 43	° ' " +72 11	h m 17 52	° ' " +37 15	h m 17 54	° ' " +51 29
	s	"	s	"	s	"	s	"	s	"
Jan. 1.0	26.94	72.9 <sup>3.6</sup>	40.59	41.9 <sup>2.9</sup>	34.14	50.8 <sup>3.5</sup>	55.98	53.0 <sup>3.1</sup>	20.47	65.9 <sup>3.4</sup>
10.9	27.16	69.3 <sup>3.3</sup>	40.75	39.0 <sup>2.7</sup>	34.36	47.3 <sup>3.4</sup>	56.14	49.9 <sup>3.0</sup>	20.63	62.5 <sup>3.3</sup>
20.9	27.49	66.0 <sup>3.0</sup>	40.96	36.3 <sup>2.5</sup>	34.71	43.9 <sup>3.0</sup>	56.33	46.9 <sup>2.8</sup>	20.84	59.2 <sup>3.0</sup>
30.9	27.91	63.0 <sup>2.5</sup>	41.19	33.8 <sup>2.1</sup>	35.18	40.9 <sup>2.6</sup>	56.57	44.1 <sup>2.4</sup>	21.11	56.2 <sup>2.6</sup>
Feb. 9.9	28.42	60.5 <sup>2.0</sup>	41.46	31.7 <sup>1.7</sup>	35.75	38.3 <sup>2.0</sup>	56.84	41.7 <sup>1.9</sup>	21.43	53.6 <sup>2.1</sup>
19.8	28.99	58.5 <sup>1.3</sup>	41.74	30.0 <sup>1.3</sup>	36.40	36.3 <sup>1.5</sup>	57.14	39.8 <sup>1.4</sup>	21.78	51.5 <sup>1.6</sup>
29.8	29.61	57.2 <sup>0.7</sup>	42.04	28.7 <sup>0.7</sup>	37.11	34.8 <sup>0.7</sup>	57.46	38.4 <sup>0.8</sup>	22.16	49.9 <sup>0.9</sup>
Mar. 10.8	30.25	56.5 <sup>0.0</sup>	42.34	28.0 <sup>0.1</sup>	37.85	34.1 <sup>0.1</sup>	57.78	37.6 <sup>0.2</sup>	22.55	49.0 <sup>0.2</sup>
20.7	30.90	56.5 <sup>0.6</sup>	42.64	27.9 <sup>0.3</sup>	38.61	34.0 <sup>0.5</sup>	58.11	37.4 <sup>0.4</sup>	22.95	48.8 <sup>0.4</sup>
30.7	31.53	57.1 <sup>1.3</sup>	42.94	28.2 <sup>0.9</sup>	39.35	34.5 <sup>1.2</sup>	58.43	37.8 <sup>0.9</sup>	23.35	49.2 <sup>1.0</sup>
Apr. 9.7	32.12	58.4 <sup>1.9</sup>	43.23	29.1 <sup>1.3</sup>	40.05	35.7 <sup>1.5</sup>	58.75	38.7 <sup>1.5</sup>	23.73	50.2 <sup>1.6</sup>
19.7	32.67	60.3 <sup>2.3</sup>	43.50	30.4 <sup>1.8</sup>	40.69	37.5 <sup>2.3</sup>	59.04	40.2 <sup>1.9</sup>	24.09	51.8 <sup>2.1</sup>
29.6	33.15	62.6 <sup>2.8</sup>	43.75	32.2 <sup>2.1</sup>	41.26	39.8 <sup>2.7</sup>	59.32	42.1 <sup>2.3</sup>	24.42	53.9 <sup>2.6</sup>
May 9.6	33.55	65.4 <sup>3.0</sup>	43.98	34.3 <sup>2.3</sup>	41.73	42.5 <sup>3.0</sup>	59.57	44.4 <sup>2.6</sup>	24.71	56.5 <sup>2.9</sup>
19.6	33.86	68.4 <sup>3.3</sup>	44.17	36.6 <sup>2.5</sup>	42.10	45.5 <sup>3.2</sup>	59.79	47.0 <sup>2.8</sup>	24.95	59.4 <sup>3.1</sup>
29.6	34.07	71.7 <sup>3.4</sup>	44.34	39.1 <sup>2.6</sup>	42.35	48.7 <sup>3.3</sup>	59.97	49.8 <sup>3.0</sup>	25.15	62.5 <sup>3.2</sup>
June 8.5	34.19	75.1 <sup>3.4</sup>	44.47	41.7 <sup>2.6</sup>	42.48	52.0 <sup>3.4</sup>	60.10	52.8 <sup>2.9</sup>	25.29	65.7 <sup>3.3</sup>
18.5	34.20	78.5 <sup>3.2</sup>	44.56	44.3 <sup>2.5</sup>	42.49	55.4 <sup>3.3</sup>	60.19	55.7 <sup>2.9</sup>	25.37	69.0 <sup>3.2</sup>
28.5	34.11	81.7 <sup>3.1</sup>	44.61	46.8 <sup>2.4</sup>	42.38	58.7 <sup>3.1</sup>	60.24	58.6 <sup>2.8</sup>	25.39	72.2 <sup>3.1</sup>
July 8.4	33.92	84.8 <sup>2.9</sup>	44.61	49.2 <sup>2.3</sup>	42.15	61.8 <sup>2.9</sup>	60.24	61.4 <sup>2.6</sup>	25.35	75.3 <sup>2.9</sup>
18.4	33.63	87.7 <sup>2.5</sup>	44.57	51.5 <sup>1.9</sup>	41.81	64.7 <sup>2.5</sup>	60.19	64.0 <sup>2.3</sup>	25.25	78.2 <sup>2.6</sup>
28.4	33.26	90.2 <sup>2.2</sup>	44.49	53.4 <sup>1.7</sup>	41.37	67.2 <sup>2.2</sup>	60.10	66.3 <sup>2.0</sup>	25.10	80.8 <sup>2.2</sup>
Aug. 7.4	32.81	92.4 <sup>1.7</sup>	44.37	55.1 <sup>1.4</sup>	40.83	69.4 <sup>1.8</sup>	59.96	68.3 <sup>1.7</sup>	24.89	83.0 <sup>1.9</sup>
17.3	32.29	94.1 <sup>1.2</sup>	44.22	56.5 <sup>1.0</sup>	40.21	71.2 <sup>1.3</sup>	59.78	70.0 <sup>1.2</sup>	24.64	84.9 <sup>1.4</sup>
27.3	31.71	95.3 <sup>0.8</sup>	44.03	57.5 <sup>0.7</sup>	39.52	72.5 <sup>0.8</sup>	59.57	71.2 <sup>0.9</sup>	24.35	86.3 <sup>1.0</sup>
Sept. 6.3	31.10	96.1 <sup>0.3</sup>	43.82	58.2 <sup>0.3</sup>	38.78	73.3 <sup>0.4</sup>	59.33	72.1 <sup>0.4</sup>	24.02	87.3 <sup>0.5</sup>
16.3	30.46	96.4 <sup>0.3</sup>	43.60	58.5 <sup>0.2</sup>	38.02	73.7 <sup>0.2</sup>	59.08	72.5 <sup>0.0</sup>	23.68	87.8 <sup>0.0</sup>
26.2	29.81	96.1 <sup>0.8</sup>	43.38	58.3 <sup>0.5</sup>	37.25	73.5 <sup>0.8</sup>	58.82	72.5 <sup>0.5</sup>	23.33	87.3 <sup>0.5</sup>
Oct. 6.2	29.18	95.3 <sup>1.3</sup>	43.16	57.8 <sup>0.9</sup>	36.48	72.7 <sup>1.2</sup>	58.57	72.0 <sup>0.9</sup>	22.98	87.3 <sup>1.1</sup>
16.2	28.58	94.0 <sup>1.9</sup>	42.95	56.9 <sup>1.3</sup>	35.75	71.5 <sup>1.8</sup>	58.32	71.1 <sup>1.4</sup>	22.65	86.2 <sup>1.5</sup>
26.1	28.02	92.1 <sup>2.3</sup>	42.77	55.6 <sup>1.7</sup>	35.07	69.7 <sup>2.2</sup>	58.11	69.7 <sup>1.8</sup>	22.35	84.7 <sup>2.0</sup>
Nov. 5.1	27.53	89.8 <sup>2.7</sup>	42.62	53.9 <sup>2.1</sup>	34.47	67.5 <sup>2.7</sup>	57.92	67.9 <sup>2.2</sup>	22.08	82.7 <sup>2.5</sup>
15.1	27.13	87.1 <sup>3.1</sup>	42.52	51.8 <sup>2.3</sup>	33.96	64.8 <sup>3.1</sup>	57.78	65.7 <sup>2.6</sup>	21.87	80.2 <sup>2.8</sup>
25.1	26.82	84.0 <sup>3.4</sup>	42.46	49.5 <sup>2.6</sup>	33.56	61.7 <sup>3.3</sup>	57.69	63.1 <sup>2.8</sup>	21.71	77.4 <sup>3.2</sup>
Dec. 5.0	26.61	80.6 <sup>3.6</sup>	42.45	46.9 <sup>2.8</sup>	33.28	58.4 <sup>3.6</sup>	57.65	60.3 <sup>3.1</sup>	21.62	74.2 <sup>3.4</sup>
15.0	26.53	77.0 <sup>3.7</sup>	42.49	44.1 <sup>2.9</sup>	33.13	54.8 <sup>3.7</sup>	57.66	57.2 <sup>3.2</sup>	21.60	70.8 <sup>3.5</sup>
25.0	26.56	73.3 <sup>3.6</sup>	42.58	41.2 <sup>3.0</sup>	33.12	51.1 <sup>3.6</sup>	57.73	54.0 <sup>3.2</sup>	21.64	67.3 <sup>3.6</sup>
35.0	26.71	69.7 <sup>3.6</sup>	42.72	38.2 <sup>3.0</sup>	33.26	47.5 <sup>3.6</sup>	57.85	50.8 <sup>3.2</sup>	21.75	63.7 <sup>3.6</sup>

# FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\gamma^2$ Sagittarii.			$\epsilon$ Herculis.			$\mu$ Sagittarii.			$\eta$ Serpentis.			$\zeta$ Sagittarii.		
	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion South.
	h m	s	°	h m	s	°	h m	s	°	h m	s	°	h m	s	°
	17 59		-30 25	18 3		+28 44	18 7		-21 4	18 16		-2 55	18 22		-25 28
Jan. 1.0	36.93		21.8	46.36		63.6	59.93		53.9	19.21		17.9	1.31		21.4
		.19	0.3		.15	2.9		.17	0.2		.15	1.3		.17	0.1
11.0	37.12		21.5	46.51		60.7	60.10		54.1	19.36		19.2	1.48		21.3
		.24	0.3		.18	2.7		.21	0.3		.18	1.2		.20	0.1
20.9	37.36		21.2	46.69		58.0	60.31		54.4	19.54		20.4	1.68		21.2
		.27	0.2		.22	2.6		.24	0.3		.21	1.2		.24	0.0
30.9	37.63		21.0	46.91		55.4	60.55		54.7	19.75		21.6	1.92		21.2
		.29	0.1		.25	2.2		.27	0.2		.24	1.1		.26	0.1
Feb. 9.9	37.92		20.9	47.16		53.2	60.82		54.9	19.99		22.7	2.18		21.1
		.31	0.0		.27	1.8		.28	0.2		.25	0.8		.29	0.0
19.8	38.23		20.9	47.43		51.4	61.10		55.1	20.24		23.5	2.47		21.1
		.32	0.0		.29	1.3		.30	0.2		.27	0.7		.30	0.1
29.8	38.55		20.9	47.72		50.1	61.40		55.3	20.51		24.2	2.77		21.0
		.33	0.0		.30	0.9		.30	0.0		.28	0.4		.31	0.1
Mar. 10.8	38.88		20.9	48.02		49.2	61.70		55.3	20.79		24.6	3.08		20.9
		.34	0.0		.30	0.2		.31	0.0		.28	0.1		.31	0.1
20.8	39.22		20.9	48.32		49.0	62.01		55.3	21.07		24.7	3.39		20.8
		.33	0.0		.31	0.2		.31	0.1		.28	0.2		.32	0.2
30.7	39.55		20.9	48.63		49.2	62.32		55.2	21.35		24.5	3.71		20.6
		.32	0.0		.29	0.8		.30	0.2		.28	0.4		.31	0.2
Apr. 9.7	39.87		20.9	48.92		50.0	62.62		55.0	21.63		24.1	4.02		20.4
		.32	0.1		.29	1.3		.29	0.2		.28	0.6		.31	0.3
19.7	40.19		21.0	49.21		51.3	62.91		54.8	21.91		23.5	4.33		20.1
		.30	0.1		.26	1.7		.28	0.3		.26	0.9		.30	0.2
29.7	40.49		21.1	49.47		53.0	63.19		54.5	22.17		22.6	4.63		19.9
		.28	0.1		.25	2.1		.27	0.3		.24	1.1		.28	0.3
May 9.6	40.77		21.2	49.72		55.1	63.46		54.2	22.41		21.5	4.91		19.6
		.25	0.2		.22	2.3		.24	0.3		.23	1.1		.27	0.2
19.6	41.02		21.4	49.94		57.4	63.70		53.9	22.64		20.4	5.18		19.4
		.23	0.2		.19	2.6		.22	0.3		.21	1.3		.23	0.1
29.6	41.25		21.6	50.13		60.0	63.92		53.6	22.85		19.1	5.41		19.3
		.20	0.3		.15	2.7		.19	0.3		.17	1.2		.21	0.1
June 8.5	41.45		21.9	50.28		62.7	64.11		53.3	23.02		17.9	5.62		19.2
		.15	0.4		.11	2.7		.15	0.2		.14	1.3		.17	0.0
18.5	41.60		22.3	50.39		65.4	64.26		53.1	23.16		16.6	5.79		19.2
		.11	0.4		.07	2.6		.11	0.2		.11	1.2		.13	0.1
28.5	41.71		22.7	50.46		68.0	64.37		52.9	23.27		15.4	5.92		19.3
		.07	0.5		.02	2.6		.08	0.0		.06	1.1		.09	0.2
July 8.5	41.78		23.2	50.48		70.6	64.45		52.9	23.33		14.3	6.01		19.5
		.02	0.6		.02	2.4		.02	0.0		.03	1.0		.04	0.2
18.4	41.80		23.8	50.46		73.0	64.47		52.9	23.36		13.3	6.05		19.7
		.03	0.5		.06	2.1		.02	0.0		.02	0.8		.01	0.3
28.4	41.77		24.3	50.40		75.1	64.45		52.9	23.34		12.5	6.04		20.0
		.07	0.5		.11	1.9		.06	0.1		.06	0.7		.05	0.3
Aug. 7.4	41.70		24.8	50.29		77.0	64.39		53.0	23.28		11.8	5.99		20.3
		.12	0.5		.14	1.6		.10	0.2		.09	0.6		.09	0.4
17.4	41.58		25.3	50.15		78.6	64.29		53.2	23.19		11.2	5.90		20.7
		.15	0.3		.18	1.2		.14	0.1		.13	0.5		.13	0.3
27.3	41.43		25.6	49.97		79.8	64.15		53.3	23.06		10.7	5.77		21.0
		.18	0.3		.20	0.9		.16	0.1		.15	0.2		.17	0.3
Sept. 6.3	41.25		25.9	49.77		80.7	63.99		53.4	22.91		10.5	5.60		21.3
		.20	0.2		.22	0.4		.18	0.1		.18	0.2		.18	0.2
16.3	41.05		26.1	49.55		81.1	63.81		53.5	22.73		10.3	5.42		21.5
		.21	0.1		.23	0.1		.20	0.1		.18	0.0		.20	0.2
26.2	40.84		26.2	49.32		81.2	63.61		53.6	22.55		10.3	5.22		21.7
		.21	0.1		.23	0.3		.19	0.0		.18	0.2		.20	0.0
Oct. 6.2	40.63		26.1	49.09		80.9	63.42		53.6	22.37		10.5	5.02		21.7
		.19	0.3		.21	0.8		.18	0.0		.18	0.3		.19	0.0
16.2	40.44		25.8	48.88		80.1	63.24		53.6	22.19		10.8	4.83		21.7
		.17	0.3		.20	1.1		.15	0.1		.15	0.4		.17	0.1
26.2	40.27		25.5	48.68		79.0	63.09		53.5	22.04		11.2	4.66		21.6
		.13	0.4		.16	1.5		.13	0.1		.13	0.6		.14	0.2
Nov. 5.1	40.14		25.1	48.52		77.5	62.96		53.4	21.91		11.8	4.52		21.4
		.09	0.5		.13	1.9		.08	0.0		.09	0.8		.10	0.2
15.1	40.05		24.6	48.39		75.6	62.88		53.4	21.82		12.6	4.42		21.2
		.03	0.5		.08	2.3		.04	0.0		.05	0.9		.05	0.2
25.1	40.02		24.1	48.31		73.3	62.84		53.4	21.77		13.5	4.37		21.0
		.01	0.5		.03	2.5		.00	0.0		.01	1.0		.01	0.2
Dec. 5.1	40.03		23.6	48.28		70.8	62.84		53.4	21.76		14.5	4.36		20.8
		.07	0.5		.02	2.7		.06	0.1		.04	1.2		.05	0.2
15.0	40.10		23.1	48.30		68.1	62.90		53.5	21.80		15.7	4.41		20.6
		.13	0.4		.06	2.9		.11	0.1		.08	1.2		.09	0.2
25.0	40.23		22.7	48.36		65.2	63.01		53.6	21.88		16.9	4.50		20.4
		.17	0.4		.12	2.9		.15	0.2		.12	1.3		.14	0.1
35.0	40.40		22.3	48.48		62.3	63.16		53.8	22.00		18.2	4.64		20.3



## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\chi$ Draconis.			$\iota$ Aquilæ.			$\zeta$ Pavonis.			$\alpha$ Lyræ. (Vega.)			$\beta$ Lyræ.		
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion South.		Right Ascension.	Declina- tion South.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.	
	h m 18 22	° ' " +72 41		h m 18 29	° ' " — 8 18		h m 18 31	° ' " —71 30		h m 18 33	° ' " +38 41		h m 18 46	° ' " +33 14	
	s	"		s	"		s	"		s	"		s	"	
Jan. 1.0	42.99	36.8	57.66	32.8	44.73	29.2	39.66	47.1	30.63	72.4					
11.0	43.09 .10	33.2 3.6	57.80 .14	33.8 1.0	45.06 .33	26.6 2.6	39.77 .11	43.9 3.2	30.73 .10	69.4 3.0					
21.0	43.33 .24	29.7 3.5	57.97 .17	34.7 0.9	45.51 .45	24.0 2.6	39.92 .15	40.9 3.0	30.86 .13	66.5 2.9					
30.9	43.70 .37	26.4 3.3	58.18 .21	35.5 0.8	46.06 .55	21.7 2.3	40.12 .20	38.0 2.9	31.04 .18	63.8 2.7					
Feb. 9.9	44.19 .49	23.5 2.9	58.41 .23	36.3 0.8	46.70 .64	19.6 2.1	40.35 .23	35.4 2.6	31.26 .22	61.3 2.5					
	59	2.4	25	0.6	72	1.7	27	2.1	24	2.1					
19.9	44.78	21.1	58.66	36.9	47.42	17.9	40.62	33.3	31.50	59.2					
29.8	45.46 .68	19.2 1.9	58.93 .27	37.3 0.4	48.19 .77	16.4 1.5	40.91 .29	31.6 1.7	31.78 .28	57.6 1.6					
Mar. 10.8	46.19 .73	17.9 1.3	59.20 .27	37.6 0.3	49.00 .81	15.4 1.0	41.23 .32	30.5 1.1	32.07 .29	56.4 1.2					
20.8	46.95 .76	17.3 0.6	59.49 .29	37.6 0.0	49.84 .84	14.7 0.7	41.55 .32	29.9 0.6	32.37 .30	55.8 0.6					
30.8	47.72 .76	17.4 0.7	59.78 .28	37.3 0.4	50.69 .84	14.4 0.1	41.89 .33	30.0 0.6	32.69 .31	55.8 0.6					
Apr. 9.7	48.48	18.1	60.06	36.9	51.53	14.5	42.22	30.6	33.00	56.4					
19.7	49.20 .72	19.4 1.3	60.34 .28	36.3 0.6	52.35 .82	15.0 0.5	42.54 .32	31.8 1.2	33.31 .31	57.5 1.1					
29.7	49.85 .65	21.2 1.8	60.62 .28	35.5 0.8	53.14 .79	15.9 0.9	42.85 .31	33.5 1.7	33.61 .30	59.0 1.5					
May 9.6	50.43 .58	23.6 2.4	60.88 .26	34.6 1.0	53.88 .74	17.1 1.2	43.13 .28	35.6 2.1	33.89 .28	61.0 2.0					
19.6	50.91 .48	26.4 2.8	61.12 .24	33.6 0.9	54.55 .67	18.6 1.5	43.39 .26	38.1 2.5	34.15 .26	63.3 2.3					
	37	3.0	22	1.0	59	1.9	22	2.8	23	2.6					
29.6	51.28	29.4	61.34	32.6	55.14	20.5	43.61	40.9	34.38	65.9					
June 8.6	51.54 .26	32.7 3.3	61.53 .19	31.6 1.0	55.65 .51	22.6 2.1	43.79 .18	43.9 3.0	34.57 .19	68.7 2.8					
18.5	51.67 .13	36.1 3.4	61.69 .16	30.6 1.0	56.05 .40	24.9 2.3	43.93 .14	46.9 3.1	34.72 .15	71.6 2.9					
28.5	51.67 .00	39.5 3.4	61.81 .12	29.6 1.0	56.34 .29	27.3 2.4	44.02 .09	50.0 3.0	34.83 .11	74.5 2.9					
July 8.5	51.55 .12	42.8 3.3	61.90 .09	28.8 0.8	56.50 .16	29.8 2.5	44.07 .05	53.0 3.0	34.90 .07	77.4 2.9					
	25	3.2	04	0.8	04	2.6	01	2.8	01	2.7					
18.5	51.30	46.0	61.94	28.0	56.54	32.4	44.06	55.8	34.91	80.1					
28.4	50.94 .36	48.9 2.9	61.94 .00	27.4 0.6	56.46 .08	34.9 2.5	44.00 .06	58.5 2.7	34.88 .03	82.7 2.6					
Aug. 7.4	50.47 .47	51.5 2.6	61.89 .05	26.9 0.5	56.25 .21	37.2 2.3	43.89 .11	60.8 2.1	34.80 .08	85.0 2.3					
17.4	49.91 .56	53.8 2.3	61.81 .08	26.5 0.4	55.93 .32	39.3 2.1	43.74 .15	62.9 2.3	34.68 .12	87.0 2.0					
27.4	49.26 .65	55.6 1.8	61.69 .12	26.2 0.3	55.50 .43	41.1 1.8	43.55 .19	64.6 1.7	34.51 .17	88.6 1.6					
	71	1.4	15	0.1	51	1.4	22	1.3	19	1.3					
Sept. 6.3	48.55	57.0	61.54	26.1	54.99	42.5	43.33	65.9	34.32	89.9					
16.3	47.79 .76	58.0 1.0	61.37 .17	26.0 0.1	54.42 .57	43.5 1.0	43.08 .25	66.8 0.9	34.10 .22	90.8 0.9					
26.3	47.00 .80	58.4 0.4	61.19 .18	26.1 0.1	53.81 .61	44.0 0.5	42.82 .26	67.2 0.4	33.86 .24	91.3 0.5					
Oct. 6.2	46.20 .79	58.1 0.1	61.01 .18	26.2 0.1	53.19 .62	44.0 0.0	42.55 .27	67.1 0.1	33.62 .24	91.4 0.1					
16.2	45.42 .78	58.3 0.7	60.83 .18	26.4 0.2	52.58 .61	43.5 0.5	42.29 .26	66.6 0.5	33.38 .24	91.0 0.4					
	75	1.2	16	0.3	56	1.0	24	1.0	22	0.8					
26.2	44.67	56.4	60.67	26.7	52.02	42.5	42.05	65.6	33.16	90.2					
Nov. 5.2	43.98 .69	54.7 1.7	60.54 .13	27.1 0.4	51.53 .49	41.0 1.5	41.84 .21	64.2 1.4	32.96 .20	89.0 1.2					
15.1	43.37 .61	52.5 2.2	60.44 .10	27.6 0.5	51.13 .40	39.1 1.9	41.66 .18	62.3 1.9	32.79 .17	87.3 1.7					
25.1	42.86 .51	49.9 2.6	60.38 .06	28.3 0.7	50.85 .28	36.9 2.2	41.52 .14	60.1 2.2	32.66 .13	85.3 2.0					
Dec. 5.1	42.46 .40	46.8 3.1	60.37 .01	29.0 0.7	50.70 .15	34.5 2.4	41.43 .09	57.5 2.6	32.57 .09	82.9 2.4					
	27	3.3	03	0.8	02	2.7	03	2.9	03	2.7					
15.0	42.19	43.5	60.40	29.8	50.68	31.8	41.40	54.6	32.54	80.2					
25.0	42.05 .14	40.0 3.5	60.47 .07	30.7 0.9	50.80 .12	29.1 2.7	41.42 .02	51.5 3.1	32.55 .01	77.4 2.8					
35.0	42.06 .01	36.3 3.7	60.59 .12	31.6 0.9	51.06 .26	26.4 2.7	41.49 .07	48.3 3.2	32.61 .06	74.4 3.0					

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	σ Sagittarii.		50 Draconis.		γ Lyrae.		ζ Aquilæ.		ι Lyrae.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 18 49	° ' " -26 24	h m 18 49	° ' " +75 19	h m 18 55	° ' " +32 33	h m 19 0	° ' " +13 43	h m 19 3	° ' " +35 56
Jan. 1.0	17.24 s	50.8 "	23.65 s	25.3 "	19.67 s	36.6 "	58.57 s	22.3 "	51.09 s	67.3 "
11.0	17.38 14	50.6 0.2	23.65 00	21.8 3.5	19.75 08	33.7 2.9	58.66 09	20.2 2.1	51.16 07	64.3 3.0
21.0	17.55 17	50.3 0.3	23.81 16	18.3 3.5	19.88 13	30.8 2.9	58.79 13	18.2 2.0	51.28 12	61.3 3.0
30.9	17.76 21	50.0 0.3	24.13 32	14.9 3.4	20.05 17	28.1 2.7	58.95 16	16.3 1.9	51.44 16	58.4 2.9
Feb. 9.9	18.01 25	49.8 0.2	24.60 47	11.9 3.0	20.25 20	25.6 2.5	59.15 20	14.5 1.8	51.64 18	55.8 2.6
	26	0.3	.60	2.7	.24	2.1	.22	1.4	.23	2.2
19.9	18.27 29	49.5 0.3	25.20 72	9.2 2.2	20.49 27	23.5 1.7	59.37 24	13.1 1.2	51.87 27	53.6 1.8
29.9	18.56 30	49.2 0.3	25.92 80	7.0 1.6	20.76 28	21.8 1.2	59.61 26	11.9 0.7	52.14 28	51.8 1.3
Mar. 10.8	18.86 31	48.9 0.4	26.72 86	5.4 0.9	21.04 30	20.6 0.6	59.87 27	11.2 0.4	52.42 31	50.5 0.8
20.8	19.17 32	48.5 0.4	27.58 89	4.5 0.3	21.34 31	20.0 0.1	60.14 28	10.8 0.1	52.73 32	49.7 0.2
30.8	19.49 32	48.1 0.5	28.47 88	4.2 0.3	21.65 32	19.9 0.5	60.42 28	10.9 0.5	53.05 32	49.5 0.5
Apr. 9.7	19.81 32	47.6 0.4	29.35 86	4.5 1.0	21.97 31	20.4 1.0	60.70 29	11.4 0.9	53.37 32	50.0 0.9
19.7	20.13 31	47.2 0.4	30.21 80	5.5 1.6	22.28 30	21.4 1.5	60.99 28	12.3 1.3	53.69 32	50.9 1.5
29.7	20.44 30	46.8 0.4	31.01 72	7.1 2.1	22.58 27	22.9 2.0	61.27 26	13.6 1.6	54.01 28	52.4 1.9
May 9.7	20.74 28	46.4 0.4	31.73 62	9.2 2.5	22.86 28	24.9 2.3	61.53 25	15.2 1.8	54.30 28	54.3 2.3
19.6	21.02 26	46.0 0.3	32.35 50	11.7 2.9	23.13 23	27.2 2.5	61.78 24	17.0 2.0	54.58 25	56.6 2.6
29.6	21.28 23	45.7 0.1	32.85 37	14.6 3.2	23.36 20	29.7 2.8	62.02 20	19.0 2.1	54.83 21	59.2 2.9
June 8.6	21.51 20	45.6 0.1	33.22 22	17.8 3.3	23.56 17	32.5 2.9	62.22 17	21.1 2.2	55.04 17	62.1 3.0
18.6	21.71 16	45.5 0.0	33.44 08	21.1 3.4	23.73 12	35.4 2.9	62.39 14	23.3 2.2	55.21 13	65.1 3.0
28.5	21.87 12	45.5 0.2	33.52 07	24.5 3.5	23.85 07	38.3 2.8	62.53 09	25.5 2.1	55.34 08	68.1 3.0
July 8.5	21.99 06	45.7 0.3	33.45 21	28.0 3.3	23.92 02	41.1 2.8	62.62 05	27.6 2.0	55.42 03	71.1 2.9
18.5	22.05 02	46.0 0.3	33.24 36	31.3 3.1	23.94 02	43.9 2.5	62.67 01	29.6 1.8	55.45 02	74.0 2.7
28.4	22.07 03	46.3 0.4	32.88 49	34.4 2.9	23.92 07	46.4 2.3	62.68 03	31.4 1.6	55.43 07	76.7 2.5
Aug. 7.4	22.04 07	46.7 0.4	32.39 61	37.3 2.6	23.85 11	48.7 2.1	62.65 08	33.0 1.4	55.36 12	79.2 2.2
17.4	21.97 11	47.1 0.5	31.78 72	39.9 2.2	23.74 16	50.8 1.7	62.57 11	34.4 1.2	55.24 16	81.4 1.8
27.4	21.86 15	47.6 0.4	31.06 80	42.1 1.8	23.58 19	52.5 1.4	62.46 14	35.6 0.9	55.08 19	83.2 1.5
Sept. 6.3	21.71 18	48.0 0.4	30.26 88	43.9 1.3	23.39 21	53.9 1.0	62.32 17	36.5 0.6	54.89 22	84.7 1.2
16.3	21.53 19	48.4 0.3	29.38 92	45.2 0.8	23.18 23	54.9 0.5	62.15 19	37.1 0.3	54.67 24	85.9 0.7
26.3	21.34 16	48.7 0.2	28.46 94	46.0 0.4	22.95 24	55.4 0.2	61.96 20	37.4 0.0	54.43 25	86.6 0.2
Oct. 6.3	21.14 20	48.9 0.1	27.52 95	46.4 0.2	22.71 24	55.6 0.3	61.76 19	37.4 0.2	54.18 25	86.8 0.2
16.2	20.94 18	49.0 0.0	26.57 91	46.2 0.8	22.47 22	55.3 0.7	61.57 18	37.2 0.6	53.93 24	86.6 0.6
26.2	20.76 15	49.0 0.1	25.66 87	45.4 1.3	22.25 20	54.6 1.2	61.39 16	36.6 0.9	53.69 22	86.0 1.1
Nov. 5.2	20.61 12	48.9 0.2	24.79 79	44.1 1.8	22.05 17	53.4 1.6	61.23 13	35.7 1.1	53.47 18	84.9 1.6
15.1	20.49 08	48.7 0.2	24.00 69	42.3 2.3	21.88 13	51.8 1.9	61.10 09	34.6 1.4	53.29 15	83.3 2.0
25.1	20.41 03	48.5 0.2	23.31 57	40.0 2.7	21.75 09	49.9 2.3	61.01 06	33.2 1.7	53.14 11	81.3 2.3
Dec. 5.1	20.38 02	48.3 0.3	22.74 44	37.3 3.1	21.66 05	47.6 2.6	60.95 02	31.5 1.8	53.03 06	79.0 2.6
15.1	20.40 06	48.0 0.3	22.30 27	34.2 3.3	21.61 01	45.0 2.8	60.93 03	29.7 2.0	52.97 01	76.4 2.8
25.0	20.46 11	47.7 0.2	22.03 12	30.9 3.5	21.62 05	42.2 2.9	60.96 07	27.7 2.1	52.96 04	73.6 3.0
35.0	20.57	47.5	21.91	27.4	21.67	39.3	61.03	25.6	53.00	70.6

# FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

383

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	<i>♌</i> Sagittarii.		<i>♐</i> Draconis.		<i>♑</i> Lyrae.		<i>♒</i> Draconis.		<i>♓</i> Aquilæ.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 19 11	° ' " -19 7	h m 19 12	° ' " +67 29	h m 19 13	° ' " +37 57	h m 19 17	° ' " +73 10	h m 19 20	° ' " +2 55
Jan. 1.0	59.69	19.5	29.09	45.5	0.64	55.6	20.34	51.2	38.23	31.1
11.0	59.80	19.6	29.07	42.0	0.69	52.5	20.26	47.7	38.31	29.7
21.0	59.94	19.7	29.16	38.4	0.80	49.5	20.32	44.2	38.43	28.3
30.9	60.12	19.8	29.35	35.0	0.95	46.6	20.52	40.8	38.58	27.0
Feb. 9.9	60.33	19.8	29.64	31.8	1.14	43.9	20.86	37.6	38.76	25.8
19.9	60.56	19.7	30.02	29.0	1.37	41.6	21.32	34.7	38.97	24.8
29.9	60.82	19.5	30.48	26.6	1.63	39.7	21.89	32.2	39.20	24.1
Mar. 10.8	61.09	19.2	31.00	24.8	1.92	38.3	22.55	30.3	39.45	23.7
20.8	61.38	18.8	31.57	23.6	2.23	37.4	23.28	29.0	39.71	23.6
30.8	61.67	18.3	32.16	23.0	2.55	37.2	24.05	28.4	39.98	23.8
Apr. 9.8	61.97	17.7	32.77	23.1	2.88	37.5	24.83	28.4	40.26	24.4
19.7	62.28	17.0	33.37	23.9	3.21	38.4	25.61	29.0	40.55	25.2
29.7	62.58	16.3	33.95	25.3	3.53	39.8	26.35	30.3	40.83	26.3
May 9.7	62.88	15.5	34.49	27.2	3.84	41.7	27.04	32.1	41.11	27.7
19.6	63.16	14.7	34.97	29.6	4.12	44.0	27.65	34.4	41.37	29.2
29.6	63.42	14.0	35.38	32.4	4.38	46.6	28.17	37.1	41.62	30.9
June 8.6	63.66	13.3	35.71	35.5	4.61	49.5	28.59	40.2	41.84	32.6
18.6	63.87	12.7	35.95	38.8	4.79	52.5	28.88	43.5	42.04	34.3
28.5	64.04	12.3	36.09	42.3	4.92	55.5	29.05	46.9	42.20	36.0
July 8.5	64.17	11.9	36.14	45.8	5.01	58.6	29.09	50.4	42.32	37.6
18.5	64.26	11.7	36.09	49.2	5.05	61.6	29.00	53.8	42.40	39.1
28.5	64.29	11.6	35.94	52.5	5.04	64.4	28.79	57.2	42.43	40.5
Aug. 7.4	64.28	11.7	35.69	55.6	4.97	67.0	28.45	60.3	42.42	41.7
17.4	64.23	11.8	35.36	58.4	4.86	69.3	27.99	63.2	42.37	42.6
27.4	64.14	12.0	34.95	60.9	4.70	71.3	27.44	65.7	42.28	43.4
Sept. 6.3	64.01	12.2	34.47	63.0	4.51	72.9	26.79	67.9	42.16	44.0
16.3	63.86	12.5	33.94	64.6	4.28	74.2	26.08	69.6	42.01	44.4
26.3	63.68	12.7	33.37	65.8	4.04	75.0	25.31	70.9	41.84	44.6
Oct. 6.3	63.49	13.0	32.77	66.4	3.78	75.4	24.50	71.6	41.66	44.6
16.2	63.31	13.2	32.17	66.5	3.52	75.3	23.69	71.9	41.48	44.4
26.2	63.13	13.4	31.57	66.1	3.28	74.8	22.88	71.6	41.31	44.0
Nov. 5.2	62.98	13.6	31.01	65.1	3.05	73.7	22.10	70.7	41.16	43.4
15.2	62.85	13.8	30.49	63.6	2.85	72.3	21.38	69.3	41.03	42.6
25.1	62.76	14.0	30.03	61.5	2.68	70.4	20.73	67.3	40.93	41.6
Dec. 5.1	62.71	14.1	29.65	59.0	2.56	68.1	20.18	64.9	40.87	40.5
15.1	62.71	14.2	29.36	56.1	2.48	65.5	19.74	62.0	40.85	39.2
25.0	62.75	14.4	29.17	52.8	2.46	62.6	19.43	58.9	40.87	37.8
35.0	62.83	14.5	29.07	49.3	2.48	59.6	19.26	55.5	40.93	36.4

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\beta$ Cygni.		$\kappa$ Aquilæ.		$\rho$ Sagittæ.		$\gamma$ Aquilæ.		$\delta$ Cygni.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 19 26	° ' " +27 45	h m 19 31	° ' " - 7 14	h m 19 36	° ' " +17 15	h m 19 41	° ' " +10 22	h m 19 41	° ' " +44 53
	s	"	s	"	s	"	s	"	s	"
Jan. 1.0	49.66	38.0	42.36	20.9	42.99	21.4	40.52	53.0	56.99	58.4
11.0	49.71	35.3	42.44	21.7	43.04	19.3	40.58	51.3	57.00	55.3
21.0	49.81	32.7	42.55	22.5	43.13	17.1	40.67	49.5	57.06	52.1
31.0	49.94	30.2	42.70	23.2	43.26	15.1	40.80	47.8	57.17	49.0
Feb. 9.9	50.11	27.8	42.88	23.7	43.42	13.2	40.96	46.3	57.33	46.1
19.9	50.31	25.8	43.08	24.2	43.61	11.6	41.14	45.0	57.54	43.4
29.9	50.55	24.1	43.31	24.4	43.83	10.3	41.35	44.0	57.80	41.2
Mar. 10.9	50.81	22.9	43.56	24.5	44.07	9.3	41.59	43.3	58.09	39.4
20.8	51.08	22.2	43.82	24.3	44.33	8.8	41.84	43.0	58.40	38.2
30.8	51.37	22.0	44.09	23.9	44.60	8.8	42.11	43.0	58.74	37.6
Apr. 9.8	51.68	22.3	44.38	23.2	44.89	9.2	42.39	43.5	59.10	37.6
19.7	51.98	23.1	44.67	22.4	45.18	10.0	42.67	44.3	59.46	38.2
29.7	52.28	24.4	44.96	21.4	45.47	11.2	42.96	45.5	59.82	39.4
May 9.7	52.58	26.1	45.24	20.2	45.75	12.7	43.24	47.0	60.17	41.1
19.7	52.85	28.2	45.52	18.9	46.02	14.6	43.51	48.7	60.49	43.3
29.6	53.11	30.6	45.78	17.6	46.28	16.7	43.77	50.6	60.79	45.8
June 8.6	53.34	33.1	46.01	16.3	46.51	19.0	44.01	52.6	61.06	48.7
18.6	53.53	35.8	46.22	15.0	46.71	21.3	44.22	54.7	61.28	51.8
28.6	53.68	38.6	46.40	13.8	46.88	23.7	44.39	56.8	61.45	55.0
July 8.5	53.79	41.4	46.54	12.7	47.00	26.0	44.52	58.8	61.57	58.3
18.5	53.86	44.1	46.63	11.8	47.09	28.3	44.61	60.8	61.64	61.6
28.5	53.88	46.6	46.69	11.0	47.13	30.4	44.66	62.6	61.64	64.7
Aug. 7.4	53.84	48.9	46.69	10.3	47.12	32.3	44.67	64.2	61.59	67.6
17.4	53.77	51.0	46.66	9.8	47.07	34.0	44.63	65.6	61.49	70.4
27.4	53.65	52.8	46.58	9.5	46.98	35.5	44.55	66.8	61.34	72.8
Sept. 6.4	53.50	54.3	46.47	9.3	46.85	36.7	44.44	67.7	61.14	74.8
16.3	53.32	55.4	46.33	9.2	46.70	37.6	44.29	68.4	60.90	76.5
26.3	53.11	56.1	46.16	9.2	46.52	38.2	44.12	68.8	60.64	77.7
Oct. 6.3	52.90	56.5	45.99	9.4	46.33	38.4	43.94	69.0	60.36	78.5
16.3	52.68	56.5	45.81	9.7	46.13	38.4	43.76	68.9	60.07	78.8
26.2	52.47	56.0	45.64	10.0	45.94	38.0	43.58	68.5	59.78	78.6
Nov. 5.2	52.27	55.2	45.48	10.5	45.77	37.3	43.41	67.9	59.51	77.9
15.2	52.10	54.0	45.35	11.0	45.62	36.3	43.27	67.0	59.26	76.7
25.1	51.96	52.4	45.25	11.6	45.50	35.0	43.16	65.9	59.04	75.0
Dec. 5.1	51.86	50.4	45.19	12.3	45.41	33.4	43.07	64.5	58.86	72.9
15.1	51.79	48.2	45.17	13.0	45.36	31.5	43.03	63.0	58.73	70.4
25.1	51.78	45.7	45.19	13.8	45.35	29.5	43.02	61.3	58.65	67.6
35.0	51.80	43.1	45.24	14.6	45.38	27.4	43.05	59.6	58.63	64.5

# FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

385

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Aquilæ. (Altair.)		$\epsilon$ Draconis.		$\epsilon$ Pavonis.		$\beta$ Aquilæ.		$\gamma$ Sagittæ.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 19 46	° ' " + 8 36	h m 19 48	° ' " + 70 1	h m 19 49	° ' " - 73 9	h m 19 50	° ' " + 6 9	h m 19 54	° ' " + 19 13
Jan. 1.1	4.76	60.5	27.20	38.6	24.46	48.3	34.66	68.3	28.06	61.7
11.0	4.81	58.8	27.06	35.3	24.55	45.4	34.71	66.7	28.10	59.6
21.0	4.90	57.2	27.04	31.8	24.77	42.4	34.80	65.2	28.17	57.4
31.0	5.03	55.6	27.14	28.3	25.12	39.4	34.92	63.8	28.28	55.3
Feb. 9.9	5.18	54.2	27.36	25.0	25.59	36.5	35.07	62.5	28.42	53.3
19.9	5.37	53.0	27.69	21.9	26.17	33.9	35.25	61.4	28.60	51.6
29.9	5.58	52.0	28.12	19.2	26.84	31.4	35.45	60.5	28.80	50.2
Mar. 10.9	5.81	51.4	28.64	17.0	27.58	29.2	35.68	60.0	29.03	49.2
20.8	6.06	51.2	29.22	15.4	28.39	27.4	35.93	59.8	29.28	48.6
30.8	6.33	51.3	29.86	14.4	29.24	25.9	36.19	59.9	29.55	48.4
Apr. 9.8	6.61	51.8	30.52	14.0	30.13	24.8	36.47	60.4	29.83	48.7
19.8	6.89	52.6	31.20	14.3	31.03	24.1	36.75	61.2	30.12	49.4
29.7	7.18	53.8	31.86	15.2	31.93	23.8	37.04	62.4	30.42	50.6
May 9.7	7.46	55.2	32.49	16.7	32.81	24.0	37.32	63.8	30.71	52.1
19.7	7.74	56.9	33.08	18.7	33.66	24.5	37.60	65.4	30.99	54.0
29.6	8.00	58.8	33.60	21.2	34.46	25.5	37.86	67.2	31.26	56.1
June 8.6	8.24	60.8	34.03	24.1	35.18	26.9	38.11	69.1	31.51	58.4
18.6	8.45	62.8	34.38	27.2	35.81	28.6	38.32	71.0	31.72	60.8
28.6	8.63	64.9	34.63	30.6	36.34	30.7	38.50	72.9	31.90	63.3
July 8.5	8.77	66.8	34.76	34.1	36.75	33.0	38.65	74.7	32.04	65.8
18.5	8.87	68.7	34.79	37.7	37.02	35.5	38.75	76.4	32.14	68.2
28.5	8.92	70.4	34.71	41.2	37.16	38.1	38.81	78.0	32.20	70.4
Aug. 7.5	8.93	72.0	34.52	44.5	37.01	40.7	38.83	79.4	32.21	72.5
17.4	8.90	73.3	34.22	47.6	37.01	43.3	38.80	80.7	32.17	74.4
27.4	8.83	74.4	33.83	50.5	36.73	45.7	38.73	81.7	32.09	76.0
Sept. 6.4	8.72	75.3	33.36	53.0	36.33	47.9	38.63	82.5	31.98	77.3
16.3	8.58	76.0	32.81	55.1	35.82	49.8	38.49	83.0	31.83	78.4
26.3	8.42	76.4	32.21	56.8	35.23	51.3	38.33	83.3	31.66	79.1
Oct. 6.3	8.24	76.6	31.57	58.0	34.58	52.3	38.16	83.4	31.47	79.5
16.3	8.06	76.5	30.90	58.7	33.91	52.8	37.98	83.3	31.27	79.6
26.2	7.89	76.1	30.23	58.8	33.23	52.7	37.81	82.9	31.08	79.3
Nov. 5.2	7.72	75.5	29.58	58.4	32.58	52.1	37.65	82.3	30.90	78.7
15.2	7.58	74.7	28.95	57.4	32.00	51.0	37.50	81.5	30.74	77.8
25.2	7.47	73.7	28.38	55.9	31.50	49.5	37.39	80.5	30.61	76.5
Dec. 5.1	7.39	72.4	27.88	53.8	31.11	47.5	37.31	79.4	30.51	75.0
15.1	7.34	71.0	27.46	51.3	30.84	45.1	37.26	78.0	30.44	73.2
25.1	7.33	69.4	27.14	48.3	30.71	42.4	37.25	76.6	30.41	71.2
35.0	7.36	67.7	26.93	45.1	30.71	39.6	37.28	75.0	30.42	69.0

# FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	♐ Sagittarii.		♏ Aquilæ.		♏ Aquilæ.		♏ Cygni.		♏ Cephei (pr).	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 19 56	° 27 58	h m 19 59	° 7 0	h m 20 6	° 1 6	h m 20 10	° 46 26	h m 20 12	° 77 25
	s	"	s	"	s	"	s	"	s	"
Jan. 1.1	43.85	33.0	25.85	33.1	19.92	16.4	35.16	73.3	3.83	37.2
	.06	.5	.04	1.5	.04	1.0	.03	3.0	0.37	3.2
11.0	43.91	32.5	25.89	31.6	19.96	17.4	35.13	70.3	3.46	34.0
	.11	.6	.08	1.5	.08	1.1	.02	3.2	0.19	3.3
21.0	44.02	31.9	25.97	30.1	20.04	18.5	35.15	67.1	3.27	30.7
	.14	.6	.11	1.5	.11	1.0	.07	3.1	0.00	3.4
31.0	44.16	31.3	26.08	28.6	20.15	19.5	35.22	64.0	3.27	27.3
	.18	.7	.14	1.3	.14	0.8	.13	3.0	0.20	3.4
Feb. 10.0	44.34	30.6	26.22	27.3	20.29	20.3	35.35	61.0	3.47	23.9
	.20	.8	.18	1.1	.17	0.7	.18	2.8	0.38	3.2
19.9	44.54	29.8	26.40	26.2	20.46	21.0	35.53	58.2	3.85	20.7
	.24	.9	.19	0.9	.19	0.5	.22	2.4	0.54	2.9
29.9	44.78	28.9	26.59	25.3	20.65	21.5	35.75	55.8	4.39	17.8
	.26	.9	.22	0.6	.22	0.2	.27	2.0	0.70	2.5
Mar. 10.9	45.04	28.0	26.81	24.7	20.87	21.7	36.02	53.8	5.09	15.3
	.28	.9	.25	0.2	.24	0.1	.30	1.5	0.83	1.9
20.8	45.32	27.1	27.06	24.5	21.11	21.6	36.32	52.3	5.92	13.4
	.28	1.0	.26	0.1	.26	0.4	.33	0.9	0.93	1.4
30.8	45.62	26.1	27.32	24.6	21.37	21.2	36.65	51.4	6.85	12.0
	.32	0.9	.27	0.5	.27	0.6	.35	0.3	0.99	0.8
Apr. 9.8	45.94	25.2	27.59	25.1	21.64	20.6	37.00	51.1	7.84	11.2
	.32	1.0	.28	0.9	.28	0.9	.37	0.3	1.02	0.1
19.8	46.26	24.2	27.87	26.0	21.92	19.7	37.37	51.4	8.86	11.1
	.33	1.0	.29	1.1	.29	1.2	.37	0.9	1.01	0.5
29.7	46.59	23.2	28.16	27.1	22.21	18.5	37.74	52.3	9.87	11.6
	.33	.9	.29	1.4	.29	1.3	.37	1.5	0.98	1.1
May 9.7	46.92	22.3	28.45	28.5	22.50	17.2	38.11	53.8	10.85	12.7
	.32	0.8	.28	1.7	.29	1.5	.35	2.0	0.92	1.7
19.7	47.24	21.5	28.73	30.2	22.79	15.7	38.46	55.8	11.77	14.4
	.30	0.7	.27	1.8	.27	1.6	.33	2.3	0.82	2.2
29.7	47.54	20.8	29.00	32.0	23.06	14.1	38.79	58.1	12.59	16.6
	.29	0.5	.24	1.9	.25	1.6	.30	2.8	0.71	2.6
June 8.6	47.83	20.3	29.24	33.9	23.31	12.5	39.09	60.9	13.30	19.2
	.26	0.3	.23	2.0	.23	1.7	.26	3.0	0.57	3.0
18.6	48.09	20.0	29.47	35.9	23.54	10.8	39.35	63.9	13.87	22.2
	.22	0.2	.19	2.0	.20	1.6	.21	3.2	0.42	3.2
28.6	48.31	19.8	29.66	37.9	23.74	9.2	39.56	67.1	14.29	25.4
	.18	0.0	.15	1.9	.17	1.5	.15	3.3	0.25	3.4
July 8.5	48.49	19.8	29.81	39.8	23.91	7.7	39.71	70.4	14.54	28.8
	.14	0.2	.11	1.8	.12	1.4	.10	3.3	0.09	3.5
18.5	48.63	20.0	29.92	41.6	24.03	6.3	39.81	73.7	14.63	32.3
	.09	0.3	.07	1.7	.08	1.3	.05	3.3	0.08	3.6
28.5	48.72	20.3	29.99	43.3	24.11	5.0	39.86	77.0	14.55	35.9
	.04	0.5	.02	1.5	.04	1.0	.02	3.1	0.26	3.4
Aug. 7.5	48.76	20.8	30.01	44.8	24.15	4.0	39.84	80.1	14.29	39.3
	.02	0.6	.02	1.3	.01	0.9	.07	3.0	0.41	3.3
17.4	48.74	21.4	29.99	46.1	24.14	3.1	39.77	83.1	13.88	42.6
	.06	0.7	.06	1.0	.05	0.7	.13	2.6	0.56	3.1
27.4	48.68	22.1	29.93	47.1	24.09	2.4	39.64	85.7	13.32	45.7
	.10	0.7	.10	0.9	.09	0.5	.17	2.4	0.69	2.8
Sept. 6.4	48.58	22.8	29.83	48.0	24.00	1.9	39.47	88.1	12.63	48.5
	.14	0.7	.13	0.6	.12	0.3	.22	2.0	0.82	2.5
16.4	48.44	23.5	29.70	48.6	23.88	1.6	39.25	90.1	11.81	51.0
	.17	0.7	.16	0.4	.15	0.2	.25	1.5	0.91	2.1
26.3	48.27	24.2	29.54	49.0	23.73	1.4	39.00	91.6	10.90	53.1
	.19	0.6	.17	0.2	.17	0.0	.28	1.2	0.99	1.6
Oct. 6.3	48.08	24.8	29.37	49.2	23.56	1.4	38.72	92.8	9.91	54.7
	.19	0.5	.17	0.1	.17	0.2	.29	0.6	1.05	1.1
16.3	47.89	25.3	29.20	49.1	23.39	1.6	38.43	93.4	8.86	55.8
	.19	0.4	.18	0.3	.17	0.4	.29	0.2	1.07	0.6
26.2	47.70	25.7	29.02	48.8	23.22	2.0	38.14	93.6	7.79	56.4
	.18	0.2	.16	0.6	.16	0.5	.28	0.4	1.07	0.1
Nov. 5.2	47.52	25.9	28.86	48.2	23.06	2.5	37.86	93.2	6.72	56.5
	.16	0.1	.15	0.7	.14	0.6	.27	0.9	1.04	0.6
15.2	47.36	26.0	28.71	47.5	22.92	3.1	37.59	92.3	5.68	55.9
	.12	0.1	.12	1.0	.12	0.8	.24	1.3	0.99	1.1
25.2	47.24	25.9	28.59	46.5	22.80	3.9	37.35	91.0	4.69	54.8
	.09	0.2	.09	1.2	.08	0.8	.21	1.9	0.90	1.7
Dec. 5.1	47.15	25.7	28.50	45.3	22.72	4.7	37.14	89.1	3.79	53.1
	.05	0.3	.05	1.3	.06	1.0	.16	2.2	0.78	2.1
15.1	47.10	25.4	28.45	44.0	22.66	5.7	36.98	86.9	3.01	51.0
	.00	0.3	.02	1.5	.01	1.0	.12	2.7	0.65	2.6
25.1	47.10	25.1	28.43	42.5	22.65	6.7	36.86	84.2	2.36	48.4
	.04	0.5	.02	1.5	.02	1.1	.07	2.9	0.48	3.0
35.1	47.14	24.6	28.45	41.0	22.67	7.8	36.79	81.3	1.88	45.4

# FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

387

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha^3$ Capricorni.		$\alpha$ Pavonis.		$\gamma$ Cygni.		$\pi$ Capricorni.		$\epsilon$ Delphini.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.
	h m 20 12	° ' " -12 50	h m 20 18	° ' " -57 2	h m 20 18	° ' " +39 56	h m 20 21	° ' " -18 31	h m 20 28	° ' " +10 58
	s	"	s	"	s	"	s	"	s	"
Jan. 1.1	42.46	28.4	0.63	34.6	45.72	69.8	48.29	31.7	36.52	44.6
	.04	.04	.03	.22	.02	.28	.03	.00	.01	1.7
11.0	42.50	28.8	0.66	32.4	45.70	67.0	48.32	31.7	36.53	42.9
	.08	.03	.10	.23	.02	3.0	.07	.00	.05	1.7
21.0	42.58	29.1	0.76	30.1	45.72	64.0	48.39	31.7	36.58	41.2
	.11	.02	.17	.24	.07	2.9	.11	.02	.08	1.6
31.0	42.69	29.3	0.93	27.7	45.79	61.1	48.50	31.5	36.66	39.6
	.14	.01	.22	.24	.11	2.8	.14	.02	.11	1.5
Feb. 10.0	42.83	29.4	1.15	25.3	45.90	58.3	48.64	31.3	36.77	38.1
	.17	0.0	.28	2.3	.16	2.6	.17	.04	.15	1.3
19.9	43.00	29.4	1.43	23.0	46.06	55.7	48.81	30.9	36.92	36.8
	.20	.01	.33	2.3	.20	2.3	.20	.05	.17	1.0
29.9	43.20	29.3	1.76	20.7	46.26	53.4	49.01	30.4	37.09	35.8
	.22	.03	.38	2.1	.24	1.8	.22	.06	.20	0.7
Mar. 10.9	43.42	29.0	2.14	18.6	46.50	51.6	49.23	29.8	37.29	35.1
	.25	.05	.42	2.0	.27	1.4	.25	.07	.22	0.4
20.9	43.67	28.5	2.56	16.6	46.77	50.2	49.48	29.1	37.51	34.7
	.26	.07	.45	1.7	.30	0.8	.26	.09	.25	0.0
30.8	43.93	27.8	3.01	14.9	47.07	49.4	49.74	28.2	37.76	34.7
	.28	0.9	.47	1.5	.32	0.2	.29	1.0	.27	0.3
Apr. 9.8	44.21	26.9	3.48	13.4	47.39	49.2	50.03	27.2	38.03	35.0
	.29	1.0	.49	1.2	.34	0.3	.29	1.1	.28	0.8
19.8	44.50	25.9	3.97	12.2	47.73	49.5	50.32	26.1	38.31	35.8
	.30	1.2	.50	0.9	.34	0.9	.31	1.2	.29	1.1
29.7	44.80	24.7	4.47	11.3	48.07	50.4	50.63	24.9	38.60	36.9
	.30	1.2	.51	0.5	.34	1.5	.31	1.2	.29	1.4
May 9.7	45.10	23.5	4.98	10.8	48.41	51.9	50.94	23.7	38.89	38.3
	.30	1.3	.49	0.2	.33	1.9	.31	1.2	.29	1.7
19.7	45.40	22.2	5.47	10.6	48.74	53.8	51.25	22.5	39.18	40.0
	.28	1.3	.48	0.1	.32	2.3	.29	1.2	.28	1.9
29.7	45.68	20.9	5.95	10.7	49.06	56.1	51.54	21.3	39.46	41.9
	.27	1.2	.45	0.5	.29	2.6	.28	1.1	.26	2.1
June 8.6	45.95	19.7	6.40	11.2	49.35	58.7	51.82	20.2	39.72	44.0
	.25	1.2	.40	0.8	.25	2.9	.26	0.9	.24	2.1
18.6	46.20	18.5	6.80	12.0	49.60	61.6	52.08	19.3	39.96	46.1
	.21	1.0	.36	1.1	.21	3.1	.23	0.8	.22	2.2
28.6	46.41	17.5	7.16	13.1	49.81	64.7	52.31	18.5	40.18	48.3
	.18	0.9	.29	1.4	.17	3.1	.20	0.6	.17	2.1
July 8.6	46.59	16.6	7.45	14.5	49.98	67.8	52.51	17.9	40.35	50.4
	.14	0.8	.23	1.7	.11	3.2	.15	0.5	.14	2.1
18.5	46.73	15.8	7.68	16.2	50.09	71.0	52.66	17.4	40.49	52.5
	.09	0.6	.15	1.9	.06	3.1	.11	0.2	.09	1.9
28.5	46.82	15.2	7.83	18.1	50.15	74.1	52.77	17.2	40.58	54.4
	.05	0.4	.07	2.0	.01	3.0	.05	0.1	.05	1.8
Aug. 7.5	46.87	14.8	7.90	20.1	50.16	77.1	52.82	17.1	40.63	56.2
	.00	0.2	.00	2.1	.05	2.8	.02	0.1	.00	1.6
17.4	46.87	14.6	7.90	22.2	50.11	79.9	52.84	17.2	40.63	57.8
	.04	0.1	.09	2.0	.09	2.5	.04	0.2	.04	1.3
27.4	46.83	14.5	7.81	24.2	50.02	82.4	52.80	17.4	40.59	59.1
	.08	0.1	.15	2.0	.14	2.2	.08	0.3	.08	1.1
Sept. 6.4	46.75	14.6	7.66	26.2	49.88	84.6	52.72	17.7	40.51	60.2
	.12	0.1	.22	1.8	.18	1.9	.11	0.4	.11	0.9
16.4	46.63	14.7	7.44	28.0	49.70	86.5	52.61	18.1	40.40	61.1
	.14	0.3	.27	1.5	.22	1.5	.14	0.5	.14	0.6
26.3	46.49	15.0	7.17	29.5	49.48	88.0	52.47	18.6	40.26	61.7
	.16	0.3	.31	1.2	.23	1.1	.16	0.5	.16	0.4
Oct. 6.3	46.33	15.3	6.86	30.7	49.25	89.1	52.31	19.1	40.10	62.1
	.18	0.4	.33	0.9	.25	0.6	.18	0.5	.17	0.1
16.3	46.15	15.7	6.53	31.6	49.00	89.7	52.13	19.6	39.93	62.2
	.17	0.4	.34	0.4	.25	0.1	.17	0.4	.18	0.2
26.3	45.98	16.1	6.19	32.0	48.75	89.8	51.96	20.0	39.75	62.0
	.16	0.4	.32	0.1	.25	0.3	.17	0.4	.17	0.5
Nov. 5.2	45.82	16.5	5.87	32.1	48.50	89.5	51.79	20.4	39.58	61.5
	.15	0.5	.30	0.4	.23	0.8	.15	0.4	.15	0.6
15.2	45.67	17.0	5.57	31.7	48.27	88.7	51.64	20.8	39.43	60.9
	.12	0.4	.26	0.9	.21	1.2	.13	0.3	.14	1.0
25.2	45.55	17.4	5.31	30.8	48.06	87.5	51.51	21.1	39.29	59.9
	.09	0.5	.20	1.2	.17	1.8	.10	0.3	.10	1.1
Dec. 5.1	45.46	17.9	5.11	29.6	47.89	85.7	51.41	21.4	39.19	58.8
	.05	0.4	.15	1.5	.14	2.1	.06	0.2	.08	1.4
15.1	45.41	18.3	4.96	28.1	47.75	83.6	51.35	21.6	39.11	57.4
	.02	0.5	.08	1.8	.11	2.4	.02	0.2	.05	1.5
25.1	45.39	18.8	4.88	26.3	47.64	81.2	51.33	21.8	39.06	55.9
	.02	0.4	.01	2.1	.05	2.7	.01	0.0	.01	1.7
35.1	45.41	19.2	4.87	24.2	47.59	78.5	51.34	21.8	39.05	54.2

# FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	Groombridge 3241.		α Delphini.		β Pavonis.		α Cygni.		ψ Capricorni.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.
	h m 20 30	° ' " +72 12	h m 20 35	° ' " +15 34	h m 20 36	° ' " -66 32	h m 20 38	° ' " +44 56	h m 20 40	° ' " -25 36
Jan. 1.1	22.91	.28 40.1	9.70	.00 33.1	15.04	.03 56.7	8.34	.06 27.5	23.38	.02 55.5
11.1	22.63	.16 37.0	9.70	.04 31.3	15.01	.06 54.1	8.28	.01 24.7	23.40	.05 55.1
21.0	22.47	.03 33.7	9.74	.07 29.4	15.07	.06 51.3	8.27	.01 21.7	23.45	.09 54.6
31.0	22.44	.11 30.3	9.81	.07 27.5	15.23	.16 48.4	8.30	.03 18.6	23.54	.09 54.0
Feb. 10.0	22.55	.23 26.9	9.91	.10 25.8	15.47	.24 45.5	8.39	.09 15.7	23.67	.13 53.2
19.9	22.78	.36 23.6	10.05	.16 24.3	15.79	.40 42.7	8.53	.19 12.9	23.83	.19 52.4
29.9	23.14	.48 20.6	10.21	.20 23.0	16.19	.46 39.9	8.72	.23 10.4	24.02	.21 51.4
Mar. 10.9	23.62	.56 18.0	10.41	.22 22.0	16.65	.52 37.4	8.95	.27 8.3	24.23	.25 50.4
20.9	24.18	.65 15.9	10.63	.25 21.5	17.17	.57 35.0	9.22	.31 6.7	24.48	.29 49.2
30.8	24.83	.70 14.4	10.88	.26 21.3	17.74	.61 32.9	9.53	.33 5.6	24.74	.31 48.0
Apr. 9.8	25.53	.74 13.5	11.14	.29 21.5	18.35	.64 31.2	9.86	.35 5.1	25.03	.31 46.7
19.8	26.27	.75 13.2	11.43	.29 22.2	18.99	.66 29.7	10.21	.37 5.1	25.34	.32 45.4
29.8	27.02	.73 13.5	11.72	.29 23.3	19.65	.67 28.7	10.58	.37 5.8	25.66	.32 44.1
May 9.7	27.75	.70 14.5	12.01	.30 24.7	20.32	.65 28.0	10.94	.36 7.0	25.98	.32 42.9
19.7	28.45	.65 16.0	12.31	.28 26.4	20.97	.64 27.8	11.30	.35 8.8	26.30	.32 41.7
29.7	29.10	.57 18.1	12.59	.27 28.4	21.61	.60 28.0	11.65	.31 10.9	26.62	.31 40.7
June 8.6	29.67	.48 20.6	12.86	.25 30.5	22.21	.55 28.5	11.96	.29 13.5	26.93	.28 39.8
18.6	30.15	.38 23.5	13.11	.22 32.8	22.76	.49 29.5	12.25	.24 16.4	27.21	.26 39.0
28.6	30.53	.27 26.7	13.33	.18 35.1	23.25	.41 30.9	12.49	.19 19.5	27.47	.22 38.5
July 8.6	30.80	.15 30.1	13.51	.14 37.5	23.66	.32 32.6	12.68	.14 22.7	27.69	.17 38.1
18.5	30.95	.02 33.7	13.65	.09 39.8	23.98	.22 34.6	12.82	.08 26.0	27.86	.13 38.0
28.5	30.97	.09 37.3	13.74	.05 42.0	24.20	.12 36.9	12.90	.08 29.3	27.99	.09 38.1
Aug. 7.5	30.88	.21 40.8	13.79	.01 44.0	24.32	.01 39.3	12.92	.02 32.5	28.08	.03 38.4
17.5	30.67	.33 44.2	13.80	.04 45.8	24.33	.09 41.7	12.89	.03 35.5	28.11	.03 38.9
27.4	30.34	.43 47.5	13.76	.08 47.4	24.24	.19 44.2	12.81	.08 38.3	28.09	.06 39.5
Sept. 6.4	29.91	.52 50.4	13.68	.11 48.8	24.05	.28 46.5	12.67	.18 40.8	28.03	.11 40.2
16.4	29.39	.60 53.1	13.57	.14 49.9	23.77	.35 48.7	12.49	.22 43.0	27.92	.14 41.0
26.3	28.79	.66 55.3	13.43	.16 50.7	23.42	.42 50.6	12.27	.24 44.8	27.78	.16 41.8
Oct. 6.3	28.13	.70 57.1	13.27	.18 51.2	23.00	.46 52.1	12.03	.27 46.2	27.62	.18 42.6
16.3	27.43	.73 58.5	13.09	.18 51.4	22.54	.47 53.2	11.76	.27 47.1	27.44	.18 43.3
26.3	26.70	.74 59.3	12.91	.17 51.4	22.07	.47 53.8	11.49	.27 47.6	27.26	.18 43.9
Nov. 5.2	25.96	.72 59.5	12.74	.16 51.0	21.60	.45 53.9	11.22	.26 47.5	27.08	.16 44.3
15.2	25.24	.69 59.2	12.58	.14 50.3	21.15	.40 53.5	10.96	.24 47.0	26.92	.14 44.7
25.2	24.55	.63 58.3	12.44	.12 49.3	20.75	.34 52.6	10.72	.21 45.9	26.78	.12 44.9
Dec. 5.2	23.92	.56 56.8	12.32	.09 48.1	20.41	.26 51.3	10.51	.18 44.4	26.66	.08 45.0
15.1	23.36	.47 54.8	12.23	.06 46.7	20.15	.18 49.5	10.33	.13 42.4	26.58	.04 44.9
25.1	22.89	.36 52.3	12.17	.02 45.0	19.97	.08 47.3	10.20	.09 40.1	26.54	.01 44.7
35.1	22.53	.36 49.4	12.15	.02 43.2	19.89	.08 44.9	10.11	.09 37.4	26.53	.01 44.4



# FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

389

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ε Cygni.		μ Aquarii.		12 Year Cat. 1879.		ν Cygni.		61 Cygni.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 20 42	° ' " +33 36	h m 20 47	° ' " - 9 20	h m 20 51	° ' " +80 11	h m 20 53	° ' " +40 47	h m 21 2	° ' " +38 16
Jan. 1.1	18.55	49.9	27.44	33.5	53.60	51.6	34.58	64.0	34.58	50.9
11.1	18.52	47.4	27.45	34.0	52.91	48.8	34.51	61.4	34.53	48.5
21.1	18.52	44.8	27.49	34.5	52.43	45.7	34.49	58.6	34.51	45.9
31.0	18.57	42.2	27.56	34.9	52.19	42.4	34.51	55.7	34.54	43.2
Feb. 10.0	18.66	39.6	27.67	35.1	52.19	39.0	34.58	52.9	34.61	40.6
20.0	18.79	37.2	27.80	35.2	52.44	35.7	34.70	50.2	34.72	38.1
29.9	18.96	35.2	27.97	35.1	52.93	32.6	34.86	47.8	34.88	35.9
Mar. 10.9	19.16	33.5	28.16	34.9	53.63	29.8	35.07	45.8	35.08	34.0
20.9	19.40	32.2	28.38	34.4	54.52	27.4	35.31	44.2	35.32	32.5
30.9	19.67	31.4	28.62	33.7	55.57	25.5	35.59	43.1	35.59	31.5
Apr. 9.8	19.96	31.1	28.88	32.8	56.75	24.2	35.90	42.6	35.90	31.1
19.8	20.27	31.4	29.16	31.7	58.00	23.5	36.23	42.6	36.23	31.2
29.8	20.59	32.2	29.45	30.4	59.28	23.5	36.58	43.2	36.57	31.8
May 9.7	20.92	33.5	29.75	29.0	60.56	24.0	36.93	44.3	36.92	33.0
19.7	21.25	35.3	30.05	27.5	61.79	25.2	37.27	45.9	37.27	34.7
29.7	21.56	37.4	30.34	26.0	62.93	26.9	37.61	48.0	37.62	36.8
June 8.7	21.85	39.8	30.62	24.5	63.95	29.1	37.93	50.4	37.94	39.2
18.6	22.11	42.5	30.89	23.1	64.82	31.7	38.21	53.2	38.23	42.0
28.6	22.34	45.4	31.12	21.7	65.52	34.7	38.46	56.2	38.50	45.0
July 8.6	22.53	48.4	31.33	20.5	66.03	38.0	38.67	59.3	38.72	48.2
18.6	22.68	51.4	31.50	19.5	66.34	41.4	38.82	62.5	38.90	51.4
28.5	22.77	54.4	31.62	18.6	66.44	44.9	38.93	65.7	39.02	54.6
Aug. 7.5	22.82	57.2	31.70	17.9	66.33	48.5	38.98	68.8	39.10	57.7
17.5	22.81	59.9	31.73	17.4	66.01	52.0	38.98	71.8	39.12	60.7
27.5	22.76	62.3	31.72	17.1	65.49	55.4	38.92	74.5	39.09	63.5
Sept. 6.4	22.66	64.5	31.66	17.0	64.78	58.6	38.82	77.0	39.01	66.0
16.4	22.52	66.3	31.57	17.0	63.91	61.5	38.67	79.2	38.89	68.2
26.4	22.35	67.8	31.45	17.2	62.88	64.1	38.48	81.0	38.73	70.1
Oct. 6.3	22.16	69.0	31.31	17.5	61.73	66.3	38.27	82.4	38.55	71.7
16.3	21.95	69.7	31.15	17.8	60.49	68.1	38.04	83.4	38.34	72.8
26.3	21.73	70.0	30.99	18.3	59.17	69.3	37.79	83.9	38.12	73.4
Nov. 5.3	21.51	69.9	30.83	18.8	57.81	70.0	37.55	84.0	37.90	73.6
15.2	21.30	69.3	30.68	19.3	56.45	70.1	37.31	83.6	37.69	73.4
25.2	21.12	68.3	30.55	19.9	55.13	69.7	37.09	82.7	37.49	72.6
Dec. 5.2	20.96	66.8	30.44	20.5	53.88	68.6	36.90	81.3	37.31	71.5
15.1	20.82	65.0	30.36	21.1	52.73	67.0	36.73	79.5	37.16	69.9
25.1	20.72	62.9	30.32	21.7	51.73	64.9	36.60	77.3	37.04	67.9
35.1	20.66	60.5	30.31	22.3	50.90	62.3	36.50	74.8	36.95	65.6

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Cygni.		τ Cygni.		α Cephei.		ι Pegasi.		ζ Capricorni.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.
	h m 21 8	° ' " +29 49	h m 21 10	° ' " +37 38	h m 21 16	° ' " +62 10	h m 21 17	° ' " +19 23	h m 21 21	° ' " -22 49
Jan. 1.1	50.09	70.4 2.2	56.60	21.0 2.5	16.10	60.9 2.7	37.93	46.5 1.8	10.03	38.3 0.2
11.1	50.04	68.2 2.4	56.52	18.5 2.6	15.87	58.2 3.0	37.89	44.7 1.9	10.01	38.1 0.4
21.1	50.03	65.8 2.4	56.49	15.9 2.7	15.72	55.2 3.2	37.88	42.8 1.9	10.02	37.7 0.5
31.0	50.05	63.4 2.4	56.50	13.2 2.6	15.65	52.0 3.3	37.91	40.9 1.9	10.07	37.2 0.6
Feb. 10.0	50.11	61.0 2.2	56.55	10.6 2.6	15.66	48.7 3.2	37.96	39.0 1.7	10.14	36.6 0.8
20.0	50.21	58.8 2.0	56.65	8.0 2.3	15.75	45.5 3.1	38.06	37.3 1.5	10.26	35.8 1.0
Mar. 1.0	50.34	56.8 1.7	56.79	5.7 1.9	15.92	42.4 2.7	38.18	35.8 1.2	10.40	34.8 1.1
10.9	50.52	55.1 1.3	56.97	3.8 1.6	16.17	39.7 2.4	38.34	34.6 0.8	10.57	33.7 1.3
20.9	50.72	53.8 0.8	57.19	2.2 1.1	16.49	37.3 1.8	38.53	33.8 0.4	10.77	32.4 1.3
30.9	50.97	53.0 0.3	57.44	1.1 0.6	16.88	35.5 1.3	38.75	33.4 0.0	11.00	31.1 1.5
Apr. 9.8	51.23	52.7 0.2	57.73	0.5 0.0	17.32	34.2 0.6	39.00	33.4 0.4	11.26	29.6 1.5
19.8	51.53	52.9 0.7	58.04	0.5 0.5	17.80	33.6 0.1	39.27	33.8 0.8	11.54	28.1 1.5
29.8	51.83	53.6 1.1	58.37	1.0 1.1	18.30	33.5 0.6	39.56	34.6 1.3	11.84	26.6 1.6
May 9.8	52.15	54.7 1.6	58.71	2.1 1.5	18.82	34.1 1.1	39.86	35.9 1.6	12.16	25.0 1.5
19.7	52.47	56.3 2.0	59.05	3.6 2.0	19.34	35.2 1.7	40.17	37.5 1.9	12.48	23.5 1.4
29.7	52.79	58.3 2.3	59.39	5.6 2.3	19.84	36.9 2.2	40.47	39.4 2.2	12.80	22.1 1.3
June 8.7	53.09	60.6 2.5	59.71	7.9 2.7	20.30	39.1 2.7	40.76	41.6 2.3	13.12	20.8 1.1
18.7	53.37	63.1 2.7	60.00	10.6 2.9	20.73	41.8 3.0	41.04	43.9 2.4	13.42	19.7 0.9
28.6	53.62	65.8 2.9	60.26	13.5 3.0	21.09	44.8 3.3	41.29	46.3 2.5	13.69	18.8 0.7
July 8.6	53.83	68.7 2.8	60.48	16.5 3.1	21.39	48.1 3.4	41.50	48.8 2.5	13.94	18.1 0.4
18.6	54.00	71.5 2.9	60.66	19.6 3.1	21.62	51.5 3.6	41.68	51.3 2.4	14.15	17.7 0.2
28.5	54.12	74.4 2.7	60.79	22.7 3.1	21.77	55.1 3.6	41.82	53.7 2.3	14.31	17.5 0.0
Aug. 7.5	54.20	77.1 2.6	60.86	25.8 2.9	21.83	58.7 3.5	41.91	56.0 2.2	14.43	17.5 0.3
17.5	54.22	79.7 2.4	60.89	28.7 2.7	21.82	62.2 3.4	41.95	58.2 1.9	14.51	17.8 0.4
27.5	54.21	82.1 2.1	60.86	31.4 2.4	21.73	65.6 3.2	41.95	60.1 1.7	14.53	18.2 0.6
Sept. 6.4	54.15	84.2 1.9	60.78	33.8 2.2	21.56	68.8 2.9	41.91	61.8 1.4	14.51	18.8 0.8
16.4	54.04	86.1 1.5	60.66	36.0 1.9	21.32	71.7 2.6	41.83	63.2 1.2	14.44	20.4 0.8
26.4	53.90	87.6 1.2	60.51	37.9 1.5	21.02	74.3 2.2	41.72	64.4 0.8	14.34	20.6 0.8
Oct. 6.4	53.74	88.8 0.8	60.32	39.4 1.1	20.68	76.5 1.8	41.58	65.2 0.5	14.21	21.2 0.8
16.3	53.55	89.6 0.4	60.11	40.5 0.6	20.29	78.3 1.3	41.42	65.7 0.3	14.05	22.0 0.8
26.3	53.36	90.0 0.0	59.89	41.1 0.2	19.87	79.6 0.7	41.25	66.0 0.1	13.89	22.8 0.7
Nov. 5.3	53.16	90.0 0.4	59.67	41.3 0.3	19.44	80.3 0.2	41.08	65.9 0.5	13.72	23.5 0.6
15.2	52.97	89.6 0.7	59.45	41.0 0.7	19.01	80.5 0.4	40.91	65.4 0.7	13.56	24.1 0.4
25.2	52.79	88.9 1.2	59.24	40.3 1.1	18.58	80.1 1.0	40.76	64.7 1.1	13.41	24.5 0.3
Dec. 5.2	52.63	87.7 1.6	59.05	39.2 1.6	18.18	79.1 1.5	40.62	63.6 1.3	13.28	24.8 0.2
15.2	52.49	86.1 1.8	58.89	37.6 2.0	17.81	77.6 2.0	40.50	62.3 1.5	13.18	25.0 0.0
25.1	52.39	84.3 2.1	58.76	35.6 2.3	17.49	75.6 2.5	40.41	60.8 1.8	13.10	25.0 0.1
35.1	52.31	82.2	58.66	33.3	17.23	73.1	40.35	59.0	13.06	24.9

# FIXED STARS, 1904.

391

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\beta$ Aquarii.		$\beta$ Cephei ( <i>pr.</i> ).		$\epsilon$ Aquarii.		74 Cygni.		$\lambda^1$ Octantis.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.
	h m 21 26	° ' " — 5 59	h m 21 27	° ' " +70 8	h m 21 32	° ' " — 8 16	h m 21 33	° ' " +39 58	h m 21 36	° ' " —83 9
<b>Jan.</b>	1.1	29.36	33.9	23.99	40.1	37.54	63.0	5.27	2.64	46.9
	1.1	29.33	34.6	23.62	37.5	37.51	63.5	5.17	1.85	43.9
	2.1	29.33	35.2	23.35	34.5	37.51	64.0	5.10	1.36	40.7
	3.1	29.37	35.7	23.18	31.3	37.53	64.4	5.08	1.17	37.2
<b>Feb.</b>	10.0	29.43	36.1	23.13	28.0	37.59	64.6	5.10	1.29	33.7
	20.0	29.53	36.3	23.19	24.7	37.68	64.6	5.17	1.71	30.1
<b>Mar.</b>	1.0	29.65	36.3	23.37	21.5	37.80	64.5	5.28	2.42	26.5
	10.9	29.80	36.1	23.66	18.5	37.95	64.2	5.44	3.39	23.1
	20.9	29.98	35.7	24.06	16.0	38.13	63.6	5.64	4.60	19.9
	30.9	30.20	35.0	24.55	13.9	38.34	62.9	5.88	6.03	17.0
<b>Apr.</b>	9.9	30.43	34.1	25.11	12.3	38.57	61.9	6.16	7.64	14.4
	19.8	30.69	33.0	25.74	11.4	38.83	60.7	6.47	9.40	12.2
	29.8	30.97	31.7	26.40	11.0	39.11	59.3	6.80	11.28	10.5
<b>May</b>	9.8	31.26	30.2	27.08	11.3	39.40	57.8	7.15	13.24	9.2
	19.7	31.56	28.6	27.76	12.2	39.70	56.1	7.50	15.23	8.4
	29.7	31.86	26.9	28.42	13.7	40.00	54.4	7.85	17.21	8.1
<b>June</b>	8.7	32.16	25.2	29.04	15.6	40.30	52.7	8.19	19.14	8.4
	18.7	32.44	23.5	29.60	18.1	40.59	51.1	8.51	20.97	9.1
	28.6	32.70	21.9	30.08	21.0	40.85	49.6	8.79	22.65	10.4
<b>July</b>	8.6	32.93	20.4	30.48	24.2	41.09	48.2	9.04	24.14	12.1
	18.6	33.12	19.0	30.78	27.6	41.29	46.9	9.24	25.40	14.2
	28.6	33.28	17.9	30.98	31.1	41.45	45.9	9.40	26.38	16.7
<b>Aug.</b>	7.5	33.39	16.9	31.07	34.8	41.57	45.0	9.50	27.06	19.5
	17.5	33.46	16.1	31.05	38.4	41.65	44.4	9.55	27.42	22.4
	27.5	33.48	15.6	30.93	41.9	41.68	44.0	9.54	27.44	25.4
<b>Sept.</b>	6.4	33.46	15.3	30.71	45.3	41.67	43.8	9.49	27.12	28.4
	16.4	33.41	15.1	30.39	48.5	41.62	43.7	9.39	26.48	31.2
	26.4	33.31	15.2	29.99	51.3	41.53	43.9	9.25	25.53	33.8
<b>Oct.</b>	6.4	33.20	15.3	29.51	53.8	41.42	44.2	9.08	24.32	36.1
	16.3	33.06	15.6	28.98	55.9	41.28	44.6	8.88	22.89	37.9
	26.3	32.91	16.1	28.40	57.5	41.13	45.1	8.66	21.30	39.2
<b>Nov.</b>	5.3	32.76	16.6	27.79	58.5	40.98	45.6	8.44	19.61	39.9
	15.3	32.61	17.2	27.17	59.0	40.83	46.2	8.21	17.89	40.0
	25.2	32.47	17.8	26.55	58.9	40.70	46.8	7.99	16.20	39.5
<b>Dec.</b>	5.2	32.35	18.5	25.96	58.2	40.58	47.5	7.79	14.62	38.4
	15.2	32.25	19.2	25.40	56.9	40.48	48.1	7.61	13.21	36.7
	25.1	32.18	19.9	24.90	55.1	40.40	48.7	7.45	12.00	34.4
	35.1	32.14	20.6	24.48	52.8	40.35	49.3	7.33	11.05	31.8

# FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ε Pegasi.		ι Cephei.		π Cygni.		μ Capricorni.		ι Pegasi.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.
	h m 21 39	° + 9 26	h m 21 40	° +70 51	h m 21 43	° +48 51	h m 21 48	° -13 59	h m 21 48	° +25 28
Jan. 1.1	27.44	.05	29.73	.41	14.00	.15	2.77	.04	40.92	.07
11.1	27.39	.02	29.32	.32	13.85	.10	2.73	.01	40.85	.05
21.1	27.37	.01	29.00	.21	13.75	.06	2.72	.01	40.80	.01
31.1	27.38	.05	28.79	.10	13.69	.01	2.73	.01	40.79	.01
Feb. 10.0	27.43	.07	28.69	.03	13.68	.05	2.77	.04	40.81	.05
20.0	27.50	.10	28.72	.14	13.73	.10	2.85	.11	40.86	.10
Mar. 1.0	27.60	.14	28.86	.27	13.83	.16	2.96	.14	40.96	.13
10.9	27.74	.17	29.13	.38	13.99	.22	3.10	.16	41.09	.17
20.9	27.91	.20	29.51	.48	14.21	.26	3.26	.16	41.26	.20
30.9	28.11	.23	29.99	.56	14.47	.31	3.46	.23	41.46	.23
Apr. 9.9	28.34	.25	30.55	.63	14.78	.34	3.69	.26	41.69	.27
19.8	28.59	.28	31.18	.68	15.12	.37	3.95	.28	41.96	.29
29.8	28.87	.30	31.86	.70	15.49	.39	4.23	.29	42.25	.30
May 9.8	29.16	.29	32.56	.71	15.88	.39	4.52	.30	42.55	.31
19.7	29.45	.30	33.27	.69	16.27	.39	4.82	.31	42.86	.32
29.7	29.75	.30	33.96	.66	16.66	.38	5.13	.31	43.18	.31
June 8.7	30.05	.28	34.62	.59	17.04	.36	5.44	.30	43.49	.30
18.7	30.33	.26	35.21	.53	17.40	.32	5.74	.28	43.79	.27
28.6	30.59	.23	35.74	.44	17.72	.28	6.02	.25	44.06	.25
July 8.6	30.82	.20	36.18	.35	18.00	.23	6.27	.22	44.31	.20
18.6	31.02	.16	36.53	.24	18.23	.17	6.49	.18	44.51	.17
28.6	31.18	.12	36.77	.13	18.40	.12	6.67	.14	44.68	.12
Aug. 7.5	31.30	.07	36.90	.02	18.52	.06	6.81	.10	44.80	.08
17.5	31.37	.03	36.92	.09	18.58	.01	6.91	.05	44.88	.03
27.5	31.40	.02	36.83	.19	18.57	.06	6.96	.00	44.91	.02
Sept. 6.5	31.38	.05	36.64	.30	18.51	.11	6.96	.04	44.89	.06
16.4	31.33	.08	36.34	.38	18.40	.16	6.92	.08	44.83	.09
26.4	31.25	.12	35.96	.46	18.24	.20	6.84	.10	44.74	.12
Oct. 6.4	31.13	.13	35.50	.53	18.04	.23	6.74	.13	44.62	.15
16.3	31.00	.15	34.97	.58	17.81	.25	6.61	.14	44.47	.16
26.3	30.85	.15	34.39	.61	17.56	.27	6.47	.15	44.31	.17
Nov. 5.3	30.70	.15	33.78	.64	17.29	.27	6.32	.15	44.14	.18
15.3	30.55	.14	33.14	.64	17.02	.27	6.17	.15	43.96	.18
25.2	30.41	.13	32.50	.62	16.75	.26	6.03	.13	43.80	.16
Dec. 5.2	30.28	.11	31.88	.59	16.49	.24	5.90	.10	43.64	.14
15.2	30.17	.09	31.29	.54	16.25	.21	5.80	.09	43.50	.12
25.2	30.08	.06	30.75	.46	16.04	.17	5.71	.06	43.38	.09
35.1	30.02	.05	30.29	.40	15.87	.15	5.65	.05	43.29	.08

# FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

393

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	79 Draconis.			α Aquarii.			α Gruis.			π² Pegasi.			θ Aquarii.		
	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion South.
	h	m	°	h	m	°	h	m	°	h	m	°	h	m	°
	21	51	+73 14	22	0	- 0 46	22	2	-47 25	22	5	+32 42	22	11	- 8 15
	s	"		s	"		s	"		s	"		s	"	
Jan. 1.1	38.62	.51	72.8	50.42	.05	67.3	9.33	.10	41.8	42.82	.10	37.6	45.28	.06	40.1
11.1	38.11	.40	70.5	50.37	.03	68.2	9.23	.06	40.5	42.72	.08	35.7	45.22	.03	40.6
21.1	37.71	.29	67.7	50.34	.00	69.0	9.17	.01	38.8	42.64	.04	33.6	45.19	.01	41.0
31.1	37.42	.16	64.7	50.34	.02	69.7	9.16	.03	36.9	42.60	.01	31.3	45.18	.01	41.3
Feb. 10.0	37.26	.02	61.5	50.36	.06	70.4	9.19	.07	34.8	42.59	.03	28.9	45.19	.05	41.5
	20.0		58.1	50.42		70.8	9.26		32.5	42.62		26.6	45.24		41.5
Mar. 1.0	37.37	.13	54.9	50.51	.09	71.1	9.38	.12	30.0	42.70	.08	24.5	45.32	.08	41.3
11.0	37.63	.26	51.8	50.63	.12	71.2	9.55	.17	27.5	42.81	.11	22.6	45.43	.11	40.9
20.9	38.02	.39	49.0	50.78	.15	71.0	9.76	.21	25.0	42.97	.16	21.1	45.58	.15	40.3
30.9	38.52	.50	46.7	50.96	.18	70.5	10.02	.26	22.5	43.17	.20	19.9	45.75	.17	39.4
		.61	1.9		.21	0.7		.29		2.4		.23		.21	1.1
Apr. 9.9	39.13	.69	44.8	51.17	.24	69.8	10.31	.33	20.1	43.40	.27	19.2	45.96	.23	38.3
19.8	39.82	.75	43.5	51.41	.26	68.8	10.64	.36	17.8	43.67	.29	18.9	46.19	.26	37.0
29.8	40.57	.79	42.7	51.67	.29	67.5	11.00	.39	15.6	43.96	.32	19.2	46.45	.28	35.6
May 9.8	41.36	.80	42.7	51.96	.29	66.1	11.39	.41	13.7	44.28	.33	19.9	46.73	.30	34.0
19.7	42.16	.78	43.2	52.25	.30	64.4	11.80	.41	12.1	44.61	.33	21.1	47.03	.31	32.2
			1.2			1.8			1.4			1.6			1.8
29.7	42.94	.74	44.4	52.55	.30	62.6	12.21	.42	10.7	44.94	.33	22.7	47.34	.30	30.4
June 8.7	43.68	.69	46.0	52.85	.29	60.8	12.63	.40	9.7	45.27	.32	24.6	47.64	.30	28.6
18.7	44.37	.61	48.2	53.14	.28	58.9	13.03	.38	9.1	45.59	.30	26.9	47.94	.28	26.9
28.6	44.98	.54	50.8	53.42	.24	57.0	13.41	.35	8.9	45.89	.26	29.5	48.22	.26	25.2
July 8.6	45.50	.41	53.8	53.66	.22	55.2	13.76	.31	9.0	46.15	.23	32.2	48.48	.23	23.7
			3.3			1.7			0.6			2.9			1.4
18.6	45.91	.29	57.1	53.88	.19	53.5	14.07	.26	9.6	46.38	.19	35.1	48.71	.20	22.3
28.6	46.20	.18	60.6	54.07	.14	52.0	14.33	.21	10.5	46.57	.14	38.0	48.91	.16	21.1
Aug. 7.5	46.38	.05	64.2	54.21	.10	50.7	14.54	.14	11.7	46.71	.09	40.9	49.07	.11	20.2
17.5	46.43	.07	67.8	54.31	.05	49.6	14.68	.08	13.2	46.80	.04	43.7	49.18	.07	19.5
27.5	46.36	.19	71.5	54.36	.01	48.7	14.76	.01	15.0	46.84	.00	46.3	49.25	.02	19.0
			3.6			0.7			1.9			2.5			0.2
Sept. 6.5	46.17	.30	75.1	54.37	.03	48.0	14.77	.04	16.9	46.84	.05	48.8	49.27	.01	18.8
16.4	45.87	.41	78.4	54.34	.06	47.6	14.73	.10	18.9	46.79	.08	51.0	49.26	.06	18.8
26.4	45.46	.50	81.5	54.28	.09	47.3	14.63	.15	20.9	46.71	.12	53.0	49.20	.08	18.9
Oct. 6.4	44.96	.58	84.3	54.19	.12	47.3	14.48	.19	22.8	46.59	.15	54.6	49.12	.11	19.2
16.4	44.38	.64	86.7	54.07	.13	47.4	14.29	.22	24.5	46.44	.17	55.9	49.01	.13	19.7
			2.0			0.3			1.5			0.9			0.5
26.3	43.74	.69	88.7	53.94	.14	47.7	14.07	.23	26.0	46.27	.18	56.8	48.88	.13	20.2
Nov. 5.3	43.05	.72	90.2	53.80	.14	48.1	13.84	.24	27.2	46.09	.18	57.4	48.75	.14	20.8
15.3	42.33	.74	91.1	53.66	.14	48.6	13.60	.24	28.0	45.91	.18	57.5	48.61	.14	21.5
25.2	41.59	.72	91.4	53.52	.13	49.3	13.36	.21	28.5	45.72	.19	57.2	48.47	.13	22.2
Dec. 5.2	40.87	.69	91.1	53.39	.11	50.0	13.15	.20	28.5	45.54	.16	56.5	48.34	.11	22.9
			0.9			0.8			0.3			1.0			0.6
15.2	40.13	.64	90.2	53.28	.09	50.8	12.95	.16	28.2	45.38	.15	55.5	48.23	.10	23.5
25.2	39.54	.57	88.8	53.19	.07	51.7	12.79	.12	27.4	45.23	.12	54.0	48.13	.07	24.1
35.1	38.97		86.8	53.12		52.5	12.67		26.3	45.11		52.3	48.06		24.7

# FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	♑ Octantis.		♒ Aquarii.		♓ Aquarii.		♊ Aquarii.		♈ Lacertæ.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.
	h m 22 12	° ' " -86 26	h m 22 16	° ' " -1 51	h m 22 20	° ' " + 0 53	h m 22 25	° ' " -11 9	h m 22 27	° ' " +49 47
	s	"	s	"	s	"	s	"	s	"
Jan. 1.2	63.96	93.5	41.16	73.5	21.77	27.5	33.28	69.9	19.76	36.0
11.1	61.83	90.8	41.09	74.3	21.70	26.6	33.21	70.3	19.57	34.0
21.1	60.21	87.7	41.05	75.0	21.65	25.8	33.16	70.6	19.41	31.7
31.1	59.15	84.3	41.03	75.6	21.63	25.0	33.14	70.7	19.29	29.1
Feb. 10.0	58.67	80.7	41.05	76.2	21.64	24.3	33.14	70.7	19.22	26.3
	0.09	3.8	0.04	0.4	0.03	0.6	0.04	0.2	0.02	2.8
20.0	58.76	76.9	41.09	76.6	21.67	23.7	33.18	70.5	19.20	23.5
Mar. 1.0	59.41	73.2	41.16	76.8	21.74	23.4	33.24	70.1	19.24	20.7
11.0	60.61	69.5	41.26	76.7	21.84	23.3	33.34	69.5	19.34	18.1
20.9	62.31	66.0	41.40	76.5	21.97	23.4	33.47	68.7	19.50	15.8
30.9	64.48	62.7	41.57	75.9	22.14	23.8	33.63	67.6	19.71	13.8
	2.57	3.0	0.20	0.8	0.19	0.6	0.20	1.2	0.27	1.5
Apr. 9.9	67.05	59.7	41.77	75.1	22.33	24.4	33.83	66.4	19.98	12.3
19.9	69.08	57.1	42.00	74.1	22.56	25.4	34.06	65.0	20.29	11.2
29.8	73.20	54.9	42.25	72.8	22.81	26.6	34.31	63.4	20.64	10.7
May 9.8	76.65	53.1	42.53	71.3	23.09	28.0	34.59	61.7	21.02	10.8
19.8	80.24	51.9	42.82	69.6	23.38	29.7	34.89	59.9	21.42	11.4
	3.67	0.8	0.30	1.8	0.30	1.8	0.30	1.8	0.41	1.2
29.7	83.91	51.1	43.12	67.8	23.68	31.5	35.19	58.1	21.83	12.6
June 8.7	87.56	50.9	43.43	65.9	23.98	33.4	35.50	56.3	22.23	14.2
18.7	91.10	51.2	43.72	64.0	24.28	35.3	35.80	54.5	22.62	16.3
28.7	94.45	52.1	44.00	62.2	24.56	37.3	36.10	52.9	22.99	18.8
July 8.6	97.52	53.5	44.26	60.4	24.82	39.1	36.37	51.4	23.32	21.6
	2.70	1.8	0.23	1.6	0.23	1.8	0.24	1.3	0.29	3.1
18.6	100.22	55.3	44.49	58.8	25.05	40.9	36.61	50.1	23.61	24.7
28.6	102.47	57.6	44.69	57.3	25.25	42.5	36.82	49.1	23.85	27.9
Aug. 7.6	104.20	60.2	44.85	56.0	25.41	44.0	36.99	48.3	24.03	31.2
17.5	105.35	63.1	44.96	54.9	25.52	45.2	37.12	47.7	24.16	34.5
27.5	105.86	66.1	45.03	54.0	25.60	46.2	37.20	47.4	24.22	37.8
	0.12	3.1	0.03	0.6	0.03	0.8	0.04	0.1	0.01	3.2
Sept. 6.5	105.76	69.2	45.06	53.4	25.63	47.0	37.24	47.3	24.23	41.0
16.4	105.00	72.2	45.05	53.0	25.62	47.6	37.23	47.4	24.19	44.0
26.4	103.62	75.1	45.00	52.8	25.57	48.0	37.19	47.7	24.09	46.8
Oct. 6.4	101.66	77.7	44.92	52.8	25.50	48.1	37.12	48.2	23.94	49.2
16.4	99.20	79.9	44.81	53.0	25.39	48.1	37.02	48.8	23.76	51.3
	2.46	1.7	0.12	0.3	0.12	0.3	0.12	0.7	0.21	1.7
26.3	96.32	81.6	44.69	53.3	25.27	47.8	36.90	49.5	23.55	53.0
Nov. 5.3	93.15	82.8	44.56	53.7	25.14	47.5	36.77	50.2	23.31	54.3
15.3	89.80	83.3	44.42	54.3	25.00	47.0	36.63	51.0	23.06	55.1
25.3	86.41	83.3	44.29	54.9	24.87	46.3	36.49	51.7	22.80	55.4
Dec. 5.2	83.09	82.6	44.16	55.7	24.74	45.6	36.36	52.4	22.53	55.2
	3.11	1.4	0.11	0.7	0.11	0.8	0.12	0.6	0.25	0.8
15.2	79.98	81.2	44.05	56.4	24.63	44.8	36.24	53.0	22.28	54.4
25.2	77.18	79.3	43.95	57.2	24.53	44.0	36.14	53.6	22.04	53.2
35.1	74.79	76.9	43.87	58.0	24.44	43.1	36.06	54.0	21.83	51.5
	2.80	1.9	0.10	0.8	0.10	0.8	0.10	0.6	0.24	1.2
	2.39	2.4	0.08	0.8	0.09	0.9	0.08	0.4	0.21	1.7

# FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

395

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Aquarii.		226 Cephei (B.).		10 Lacertæ.		β Octantis.		ζ Pegasi.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.
	h m 22 30	° 0 36	h m 22 30	° +75 43	h m 22 34	° +38 32	h m 22 36	° -81 52	h m 22 36	° +10 19
	s	"	s	"	s	"	s	"	s	"
Jan. 1.2	24.76	.07	34.88	.69	56.81	.14	75.4	1.00	39.92	.09
11.1	24.69	.05	34.19	.60	56.67	.12	73.6	0.81	39.83	.06
21.1	24.64	.03	33.59	.47	56.55	.08	71.5	0.58	39.77	.04
31.1	24.61	.01	33.12	.34	56.47	.05	69.2	0.35	39.73	.02
Feb. 10.1	24.60	.03	32.78	.18	56.42	.01	66.8	0.10	39.71	.02
	20.0	.06	32.60	.02	56.41	.04	64.4	0.14	39.73	.05
Mar. 1.0	24.69	.09	32.58	.15	56.45	.08	62.0	0.37	39.78	.08
11.0	24.78	.12	32.73	.31	56.53	.13	59.8	0.61	39.86	.11
20.9	24.90	.15	33.04	.46	56.66	.18	57.9	0.81	39.97	.15
30.9	25.05	.19	33.50	.60	56.84	.22	56.4	1.01	40.12	.19
	20.0	.22	34.10	.72	57.06	.26	55.2	1.19	40.31	.22
Apr. 9.9	25.24	.25	34.82	.81	57.32	.30	54.5	1.34	40.53	.25
19.9	25.46	.27	35.63	.87	57.62	.32	54.4	1.46	40.78	.27
29.8	25.71	.29	36.50	.91	57.94	.34	54.7	1.56	41.05	.29
May 9.8	25.98	.30	37.41	.92	58.28	.36	55.6	1.62	41.34	.30
19.8	26.27	.31	38.33	.91	58.64	.35	56.9	1.63	41.64	.31
	20.0	.30	39.24	.86	58.99	.35	58.6	1.62	41.95	.30
June 8.7	26.88	.28	40.10	.79	59.34	.32	60.7	1.56	42.25	.29
18.7	27.18	.27	40.89	.70	59.66	.30	63.1	1.46	42.54	.26
28.7	27.46	.24	41.59	.59	59.96	.27	65.8	1.32	42.80	.24
July 8.6	27.73	.20	42.18	.48	60.23	.22	68.7	1.14	43.04	.21
	18.6	.17	42.66	.35	60.45	.18	71.6	0.92	43.25	.17
Aug. 7.6	28.17	.13	43.01	.21	60.63	.13	74.7	0.67	43.42	.13
17.5	28.47	.08	43.22	.07	60.76	.08	77.7	0.41	43.55	.09
27.5	28.55	.04	43.29	.07	60.84	.03	80.6	0.12	43.64	.04
	20.0	.00	43.22	.20	60.87	.02	83.4	0.17	43.68	.00
Sept. 6.5	28.59	.03	43.02	.33	60.85	.06	86.0	0.44	43.68	.03
16.5	28.59	.07	42.69	.45	60.79	.10	88.3	0.71	43.65	.06
26.4	28.56	.09	42.24	.55	60.69	.13	90.4	0.94	43.59	.09
Oct. 6.4	28.49	.12	41.69	.65	60.56	.16	92.1	1.14	43.50	.12
	20.0	.12	41.04	.73	60.40	.18	93.4	1.29	43.38	.12
Nov. 5.3	28.28	.14	40.31	.79	60.22	.19	94.4	1.39	43.26	.14
15.3	28.02	.13	39.52	.83	60.03	.20	94.9	1.44	43.12	.13
25.3	27.89	.13	38.69	.84	59.83	.20	95.0	1.42	42.99	.14
Dec. 5.2	27.76	.11	37.85	.84	59.63	.19	94.7	1.37	42.85	.12
	15.2	.11	37.01	.81	59.44	.17	93.9	1.26	42.73	.11
25.2	27.54	.08	36.20	.75	59.27	.16	92.7	1.00	42.62	.10
35.2	27.46	.08	35.45	.75	59.11	.16	91.1	1.10	42.52	.10

# FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	λ Pegasi.			ε Cephei.			λ Aquarii.			α Piscis Australis. (Fomalhaut.)			α Andromedæ.		
	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension		Declina- tion South.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.
	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "
	22 41		+23 3	22 46		+65 41	22 47		- 8 5	22 52		-30 7	22 57		+41 48
Jan. 1.2	53.97		46.5	15.54		62.7	35.75		26.5	19.88		59.4	29.97		50.1
11.1	53.86	.11	45.0	15.15	.39	60.9	35.67	.08	27.0	19.77	.11	59.1	29.80	.17	48.4
21.1	53.78	.08	43.4	14.81	.34	58.7	35.60	.07	27.0	19.69	.08	58.5	29.66	.14	46.5
31.1	53.72	.06	41.7	14.54	.27	56.1	35.56	.04	27.4	19.63	.06	57.9	29.54	.12	44.3
Feb. 10.1	53.69	.03	39.9	14.34	.20	53.2	35.55	.01	27.9	19.61	.02	56.5	29.46	.08	41.9
		.00			.12			.01			.01			.04	
20.0	53.69		38.1	14.22		50.1	35.56		27.8	19.62		55.2	29.42		39.4
Mar. 1.0	53.73	.04	36.5	14.20	.02	47.0	35.60	.04	27.6	19.66	.04	53.6	29.42	.00	36.9
11.0	53.80	.07	35.1	14.28	.08	43.9	35.67	.07	27.2	19.74	.08	51.8	29.47	.05	34.6
21.0	53.91	.11	34.0	14.45	.17	41.0	35.78	.11	26.5	19.85	.11	49.9	29.58	.11	32.5
30.9	54.06	.15	33.1	14.72	.27	38.4	35.92	.14	25.6	20.00	.15	47.8	29.74	.16	30.8
		.19			.35			.17			.19			.20	
Apr. 9.9	54.25		32.7	15.07		36.3	36.09		24.5	20.19		45.7	29.94		29.4
19.9	54.48	.23	32.6	15.50	.43	34.6	36.30	.21	23.1	20.42	.23	43.5	30.19	.25	28.4
29.8	54.74	.26	33.0	15.99	.49	33.4	36.54	.24	21.6	20.68	.26	41.3	30.48	.29	27.9
May 9.8	55.02	.28	33.8	16.53	.54	32.8	36.81	.27	19.9	20.97	.29	39.1	30.81	.33	28.0
19.8	55.32	.30	35.0	17.10	.57	32.8	37.10	.29	18.1	21.29	.32	37.0	31.16	.35	28.5
		.32			.59			.30			.33			.36	
29.8	55.64		36.5	17.69		33.4	37.40		16.2	21.62		35.0	31.52		29.6
June 8.7	55.96	.32	38.3	18.28	.59	34.6	37.70	.30	14.3	21.96	.34	33.3	31.89	.37	31.1
18.7	56.27	.31	40.4	18.85	.57	36.3	38.01	.31	12.5	22.30	.34	31.8	32.26	.37	33.0
28.7	56.57	.30	42.7	19.38	.53	38.5	38.31	.30	10.7	22.63	.33	30.5	32.61	.35	35.2
July 8.7	56.85	.28	45.1	19.87	.49	41.1	38.58	.27	9.1	22.95	.32	29.6	32.94	.33	37.8
		.25			.42			.26			.29			.29	
18.6	57.10		47.6	20.29		44.0	38.84		7.6	23.24		29.0	33.23		40.6
28.6	57.31	.21	50.1	20.65	.36	47.2	39.06	.22	6.3	23.49	.25	28.7	33.48	.25	43.6
Aug. 7.6	57.49	.18	52.6	20.93	.28	50.6	39.25	.19	5.3	23.71	.22	28.8	33.69	.21	46.6
17.5	57.62	.13	55.0	21.12	.19	54.2	39.39	.14	4.5	23.88	.17	29.3	33.85	.16	49.7
27.5	57.71	.09	57.3	21.23	.11	57.8	39.50	.11	4.0	24.00	.12	30.0	33.96	.11	52.7
		.05			.03			.06			.08			.06	
Sept. 6.5	57.76		59.4	21.26		61.4	39.56		3.7	24.08		31.0	34.02		55.6
16.5	57.76	.00	61.2	21.20	.06	64.9	39.58	.02	3.6	24.10	.02	32.2	34.03	.01	58.4
26.4	57.73	.03	62.8	21.06	.14	68.2	39.55	.03	3.7	24.08	.02	33.0	34.00	.03	61.0
Oct. 6.4	57.66	.07	64.1	20.85	.21	71.3	39.50	.05	4.1	24.02	.06	35.0	33.92	.08	63.3
16.4	57.56	.10	65.2	20.57	.28	74.1	39.42	.08	4.6	23.92	.10	36.5	33.80	.12	65.3
		.12			.34			.10			.12			.14	
26.4	57.44		66.0	20.23		75.5	39.32		5.2	23.80		38.0	33.66		66.9
Nov. 5.3	57.30	.14	66.4	19.85	.38	78.4	39.20	.12	5.8	23.66	.14	39.3	33.49	.17	68.2
15.3	57.16	.14	66.5	19.43	.42	79.9	39.07	.13	6.5	23.50	.16	40.5	33.30	.19	69.0
25.3	57.01	.15	66.3	18.99	.44	80.8	38.94	.13	7.3	23.34	.16	41.4	33.10	.20	69.4
Dec. 5.2	56.86	.15	65.8	18.53	.46	81.1	38.81	.13	8.0	23.19	.15	42.1	32.89	.21	69.3
		.15			.46			.12			.15			.20	
15.2	56.71		65.0	18.07		80.9	38.69		8.7	23.04		42.6	32.69		68.8
25.2	56.58	.13	63.9	17.62	.45	80.0	38.58	.11	9.4	22.90	.14	42.7	32.49	.20	67.8
35.2	56.46	.12	62.6	17.21	.41	78.6	38.49	.09	10.0	22.79	.11	42.6	32.31	.18	66.4



# FIXED STARS, 1904.

397

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Pegasi. (Markab.)			$\phi$ Aquarii.			$\sigma$ Cephei.			$\tau$ Pegasi.			$\theta$ Piscium.		
	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.
	h m	s	°	h m	s	°	h m	s	°	h m	s	°	h m	s	°
	22 59		+14 41	23 9		- 6 33	23 14		+67 34	23 15		+23 12	23 23		+ 5 51
Jan. 1.2	58.33		25.4	20.53		60.9	41.17		89.7	52.86		61.7	5.57		8.5
11.2	58.23	.10	24.2	20.44	.09	61.5	40.72	.45	88.3	52.74	.12	60.4	5.46	.11	7.6
21.1	58.14	.09	22.9	20.36	.08	62.0	40.31	.41	86.4	52.63	.11	59.0	5.37	.09	6.7
31.1	58.08	.06	21.6	20.30	.06	62.4	39.96	.35	84.1	52.54	.09	57.4	5.30	.07	5.8
Feb. 10.1	58.04	.04	20.2	20.26	.04	62.6	39.68	.28	81.4	52.48	.06	55.7	5.24	.06	4.9
		.01	19.0	20.25	.01	62.6	39.49	.19			.03			.02	
Mar. 20.1	58.03		17.8	20.27		62.5	39.39		78.5	52.45		54.1	5.22		4.2
1.0	58.05	.02	16.9	20.32	.02	62.1	39.40	.10	75.4	52.45	.00	52.5	5.22	.00	3.6
11.0	58.11	.06	16.2	20.40	.05	62.1	39.51	.01	72.3	52.49	.04	51.1	5.25	.03	3.2
21.0	58.20	.09	15.8	20.52	.08	61.5	39.51	.11	69.3	52.56	.07	49.9	5.32	.12	3.0
30.9	58.33	.13	15.8	20.52	.12	60.7	39.73	.22	66.6	52.68	.12	49.0	5.43	.09	3.1
		.17	15.8	20.52	.16	60.7	39.73	.31			.16			.14	
Apr. 9.9	58.50		15.7	20.68		59.7	40.04		64.2	52.84		48.5	5.57		3.5
19.9	58.70	.20	16.0	20.87	.19	58.4	40.45	.41	62.2	53.04	.20	48.3	5.75	.18	4.2
29.9	58.94	.24	16.7	21.10	.23	56.9	40.94	.49	60.7	53.27	.23	48.5	5.97	.22	5.2
May 8.8	59.21	.27	17.6	21.35	.25	55.2	41.49	.55	59.7	53.54	.27	49.1	6.21	.24	6.4
19.8	59.49	.28	18.9	21.63	.28	53.4	42.08	.59	59.3	53.83	.29	50.1	6.48	.27	7.9
		.31	18.9	21.63	.29	53.4	42.08	.63			.31			.30	
June 29.8	59.80		20.5	21.92		51.5	42.71		59.6	54.14		51.4	6.78		9.6
8.7	60.11	.31	22.4	22.23	.31	49.6	43.34	.63	60.3	54.46	.32	53.1	7.08	.30	11.5
18.7	60.41	.30	24.4	22.53	.30	47.6	43.97	.63	61.7	54.78	.32	55.0	7.38	.30	13.5
28.7	60.71	.30	26.5	22.84	.31	45.8	44.57	.60	63.5	55.10	.32	57.2	7.68	.30	15.5
July 8.7	60.99	.28	28.8	23.12	.28	44.1	45.13	.56	65.8	55.39	.29	59.5	7.97	.29	17.5
		.26	28.8	23.12	.27	44.1	45.13	.51			.28			.27	
18.6	61.25		31.0	23.39		42.5	45.64		68.5	55.67		61.9	8.24		19.5
28.6	61.48	.23	33.2	23.62	.23	41.1	46.08	.44	71.5	55.91	.24	64.4	8.48	.24	21.4
Aug. 7.6	61.67	.19	35.4	23.82	.20	39.9	46.44	.36	74.8	56.12	.21	66.8	8.69	.21	23.1
17.6	61.82	.15	37.4	23.99	.17	39.0	46.71	.27	78.2	56.28	.16	69.2	8.86	.17	24.7
27.5	61.93	.11	39.2	24.11	.12	38.4	46.90	.19	81.8	56.41	.13	71.4	8.99	.13	26.1
		.06	39.2	24.11	.08	38.4	46.90	.11			.08			.09	
Sept. 6.5	61.99		40.8	24.19		38.0	47.01		85.5	56.49		73.5	9.08		27.2
16.5	62.02	.03	42.2	24.23	.04	37.8	47.02	.01	89.0	56.53	.04	75.4	9.14	.06	28.1
26.5	62.01	.01	43.4	24.23	.00	37.9	46.95	.07	92.5	56.53	.00	77.1	9.15	.01	28.8
Oct. 6.4	61.96	.05	44.3	24.20	.03	38.1	46.79	.16	95.8	56.50	.03	78.5	9.13	.02	29.3
16.4	61.89	.07	45.0	24.14	.06	38.6	46.56	.23	98.8	56.44	.06	79.7	9.08	.05	29.5
		.10	45.0	24.14	.09	38.6	46.56	.30			.09			.08	
Nov. 26.4	61.79		45.5	24.05		39.1	46.26		101.5	56.35		80.6	9.00		29.5
5.3	61.68	.11	45.6	23.95	.10	39.8	45.90	.36	103.9	56.23	.12	81.2	8.91	.09	29.4
15.3	61.55	.13	45.6	23.83	.12	40.5	45.49	.41	105.7	56.11	.12	81.5	8.80	.11	29.1
25.3	61.42	.13	45.3	23.71	.13	41.3	45.03	.46	107.0	55.97	.14	81.5	8.68	.12	28.6
Dec. 5.3	61.28	.14	44.7	23.58	.13	42.1	44.55	.48	107.8	55.83	.14	81.1	8.56	.12	28.0
		.13	44.7	23.58	.12	42.1	44.55	.49			.14			.12	
15.2	61.15		44.0	23.46		42.8	44.06		108.0	55.69		80.5	8.44		27.2
25.2	61.03	.12	43.0	23.34	.12	43.5	43.57	.49	107.5	55.55	.14	79.7	8.32	.12	26.4
35.2	60.92	.11	41.9	23.24	.10	44.1	43.09	.48	106.5	55.42	.13	78.5	8.21	.11	25.5

## FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\lambda$ Andromedæ.			$\epsilon$ Piscium.			$\gamma$ Cephei.			$\beta$ Aquarii.		
	Right Ascension.		Declination North.	Right Ascension.		Declination North.	Right Ascension.		Declination North.	Right Ascension.		Declination South.
	h	m	°	h	m	°	h	m	°	h	m	°
	23	32	+45 56	23	35	+ 5 6	23	35	+77 5	23	39	-18 48
	s	"	"	s	"	"	s	"	"	s	"	"
Jan. 1.2	51.97	.21	31.5	0.49	.11	23.2	25.47	.87	67.9	12.88	.11	41.8
11.2	51.76	.19	30.2	0.38	.10	22.3	24.60	.81	67.0	12.77	.10	42.1
21.2	51.57	.16	28.5	0.28	.08	21.4	23.79	.72	65.5	12.67	.09	42.2
31.1	51.41	.14	26.5	0.20	.06	20.5	23.07	.60	63.5	12.58	.07	42.0
Feb. 10.1	51.27	.09	24.2	0.14	.04	19.7	22.47	.46	61.0	12.51	.04	41.6
20.1	51.18	.05	21.8	0.10	.01	19.0	22.01	.29	58.2	12.47	.01	40.9
Mar. 1.0	51.13	.01	19.3	0.09	.02	18.5	21.72	.12	55.1	12.46	.02	40.0
11.0	51.14	.06	16.8	0.11	.06	18.1	21.60	.07	51.9	12.48	.05	38.9
21.0	51.20	.12	14.5	0.17	.10	18.0	21.67	.25	48.7	12.53	.10	37.6
31.0	51.32	.17	12.4	0.27	.13	18.1	21.92	.43	45.7	12.63	.13	36.0
Apr. 9.9	51.49	.23	10.7	0.40	.17	18.6	22.35	.59	43.0	12.76	.17	34.3
19.9	51.72	.28	9.3	0.57	.21	19.2	22.94	.73	40.6	12.93	.20	32.4
29.9	52.00	.32	8.4	0.78	.24	20.2	23.67	.84	38.6	13.13	.25	30.3
May 9.9	52.32	.35	8.0	1.02	.27	21.5	24.51	.94	37.2	13.38	.27	28.2
19.8	52.67	.38	8.1	1.29	.28	23.0	25.45	.99	36.3	13.65	.29	26.1
29.8	53.05	.39	8.7	1.57	.30	24.6	26.44	1.02	36.0	13.94	.31	23.9
June 8.8	53.44	.39	9.8	1.87	.31	26.5	27.46	1.01	36.3	14.25	.32	21.8
18.7	53.83	.39	11.3	2.18	.31	28.4	28.47	.99	37.2	14.57	.31	19.9
28.7	54.22	.37	13.2	2.49	.29	30.4	29.46	.94	38.6	14.88	.31	18.1
July 8.7	54.59	.34	15.5	2.78	.27	32.4	30.40	.85	40.5	15.19	.29	16.6
18.6	54.93	.30	18.1	3.05	.25	34.4	31.25	.75	42.9	15.48	.27	15.3
28.6	55.23	.26	20.9	3.30	.22	36.3	32.00	.64	45.6	15.75	.23	14.3
Aug. 7.6	55.49	.21	23.8	3.52	.18	38.0	32.64	.51	48.7	15.98	.20	13.6
17.6	55.70	.17	26.9	3.70	.14	39.5	33.15	.37	52.1	16.18	.16	13.2
27.5	55.87	.11	30.0	3.84	.11	40.8	33.52	.23	55.7	16.34	.11	13.2
Sept. 6.5	55.98	.06	33.0	3.95	.06	41.9	33.75	.09	59.3	16.45	.08	13.5
16.5	56.04	.01	36.0	4.01	.03	42.8	33.84	.06	63.1	16.53	.03	14.0
26.5	56.05	.03	38.8	4.04	.01	43.4	33.78	.20	66.8	16.56	.01	14.8
Oct. 6.4	56.02	.08	41.4	4.03	.04	43.8	33.58	.34	70.4	16.55	.04	15.8
16.4	55.94	.12	43.7	3.99	.06	44.0	33.24	.47	73.8	16.51	.07	16.9
26.4	55.82	.15	45.7	3.93	.08	44.0	32.77	.59	76.9	16.44	.09	18.1
Nov. 5.4	55.67	.17	47.4	3.85	.10	43.8	32.18	.69	79.7	16.35	.11	19.3
15.3	55.50	.19	48.7	3.75	.12	43.4	31.49	.78	82.0	16.24	.13	20.5
25.3	55.31	.21	49.5	3.64	.11	42.9	30.71	.85	83.8	16.11	.13	21.6
Dec. 5.3	55.10	.22	49.9	3.52	.12	42.3	29.86	.89	85.1	15.98	.13	22.5
15.3	54.88	.22	49.8	3.40	.12	41.6	28.97	.91	85.8	15.85	.13	23.3
25.2	54.66	.22	49.2	3.28	.11	40.8	28.06	.90	85.9	15.72	.12	24.0
35.2	54.44		48.2	3.17		39.9	27.16		85.4	15.60		24.4

# FIXED STARS, 1904.

(CONSTANTS OF STRUVE AND PETERS.)

399

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\delta$ Sculptoris.		$\gamma^1$ Octantis.		Groombridge 4163		$\omega$ Piscium.	
	Right Ascension.	Declination South.	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	h m 23 43	° ' " -28 39	h m 23 46	° ' " -82 32	h m 23 50	° ' " +73 52	h m 23 54	° ' " + 6 19
Jan. 1.2	54.92	50.8	22.00	87.4	10.41	53.5	22.75	56.2
11.2	54.79	50.8	20.55	85.8	9.72	52.7	22.64	55.4
21.2	54.67	50.5	19.24	83.6	9.07	51.4	22.53	54.5
31.1	54.57	49.9	18.12	81.0	8.48	49.5	22.43	53.6
Feb. 10.1	54.49	49.0	17.19	78.0	7.97	47.1	22.35	52.8
20.1	54.44	47.9	16.50	74.6	7.58	44.4	22.30	52.1
Mar. 1.1	54.41	46.4	16.05	71.0	7.31	41.4	22.27	51.5
11.0	54.43	44.7	15.86	67.3	7.18	38.3	22.27	51.1
21.0	54.48	42.8	15.91	63.5	7.19	35.2	22.31	50.9
31.0	54.57	40.7	16.22	59.7	7.36	32.2	22.39	51.0
Apr. 10.0	54.70	38.5	16.78	56.1	7.66	29.4	22.50	51.3
19.9	54.87	36.1	17.57	52.6	8.11	27.0	22.66	51.9
29.9	55.08	33.7	18.58	49.3	8.67	25.0	22.85	52.8
May 9.9	55.33	31.3	19.79	46.4	9.33	23.5	23.07	54.0
19.8	55.61	28.9	21.17	43.9	10.08	22.5	23.33	55.4
29.8	55.92	26.6	22.70	41.9	10.88	22.1	23.61	57.1
June 8.8	56.24	24.5	24.33	40.3	11.72	22.3	23.91	58.9
18.8	56.58	22.6	26.02	39.3	12.57	23.0	24.21	60.8
28.7	56.91	21.0	27.74	38.8	13.40	24.3	24.52	62.8
July 8.7	57.24	19.6	29.44	38.9	14.19	26.1	24.82	64.8
18.7	57.55	18.6	31.06	39.5	14.92	28.3	25.10	66.8
28.6	57.84	18.0	32.57	40.7	15.58	31.0	25.36	68.7
Aug. 7.6	58.09	17.8	33.91	42.4	16.16	34.0	25.59	70.5
17.6	58.31	17.9	35.04	44.6	16.63	37.3	25.79	72.1
27.6	58.48	18.4	35.93	47.1	17.00	40.8	25.95	73.5
Sept. 6.5	58.61	19.2	36.54	50.0	17.25	44.4	26.07	74.7
16.5	58.69	20.3	36.85	53.0	17.39	48.0	26.16	75.6
26.5	58.72	21.6	36.85	56.1	17.41	51.7	26.20	76.3
Oct. 6.5	58.72	23.1	36.54	59.2	17.31	55.3	26.21	76.8
16.4	58.67	24.7	35.93	62.2	17.10	58.7	26.20	77.1
26.4	58.60	26.4	35.05	64.9	16.79	61.8	26.15	77.2
Nov. 5.4	58.49	27.9	33.92	67.2	16.38	64.6	26.08	77.0
15.4	58.37	29.4	32.60	69.0	15.88	67.0	25.99	76.7
25.3	58.23	30.7	31.13	70.3	15.31	68.9	25.89	76.3
Dec. 5.3	58.08	31.8	29.57	71.0	14.67	70.3	25.78	75.8
15.3	57.93	32.6	27.98	71.0	13.99	71.2	25.66	75.1
25.2	57.79	33.2	26.40	70.4	13.28	71.4	25.54	74.3
35.2	57.65	33.4	24.90	69.2	12.57	71.0	25.42	73.5

## FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Meridian.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ' "	"	s	"	m s	"	m s	h m s
Jan. 0	18 38 35.83	36.35	-23 9 9.1	8.6	11.058	+ 10.18	+ 2 48.53	16 17.87	1 11.11	18 35 47.36
1	18 43 1.09	1.69	23 4 50.6	50.0	11.047	11.34	3 17.22	16 17.89	1 11.07	18 39 43.92
2	18 47 26.04	26.73	23 0 4.5	3.7	11.033	12.50	4 45.63	16 17.91	1 11.04	18 43 40.47
3	18 51 50.65	51.43	22 54 50.7	49.8	11.019	13.64	4 13.70	16 17.91	1 11.00	18 47 37.03
4	18 56 14.92	15.78	22 49 9.6	8.5	11.004	14.78	4 41.41	16 17.90	1 10.95	18 51 33.59
5	19 0 38.80	39.74	-22 43 1.3	0.0	10.988	+ 15.91	+ 5 8.75	16 17.89	1 10.90	18 55 30.15
6	19 5 2.29	3.31	22 36 26.0	24.4	10.970	17.03	5 35.68	16 17.87	1 10.84	18 59 26.70
7	19 9 25.34	26.44	22 29 23.7	21.9	10.951	18.15	6 2.18	16 17.84	1 10.78	19 3 23.26
8	19 13 47.94	49.12	22 21 54.8	52.8	10.932	19.26	6 28.24	16 17.81	1 10.71	19 7 19.82
9	19 18 10.07	11.33	22 13 59.5	57.2	10.912	20.35	6 53.83	16 17.77	1 10.64	19 11 16.37
10	19 22 31.70	33.03	-22 5 38.0	35.4	10.890	+ 21.44	+ 7 18.90	16 17.73	1 10.56	19 15 12.93
11	19 26 52.79	54.19	21 56 50.5	47.6	10.867	22.52	7 43.44	16 17.69	1 10.48	19 19 9.49
12	19 31 13.34	14.80	21 47 37.4	34.2	10.844	23.58	8 7.43	16 17.64	1 10.40	19 23 6.04
13	19 35 33.30	34.84	21 37 58.7	55.3	10.820	24.63	8 30.84	16 17.59	1 10.32	19 27 2.60
14	19 39 52.66	54.26	21 27 55.0	51.2	10.793	25.67	8 53.64	16 17.53	1 10.24	19 30 59.16
15	19 44 11.40	13.06	-21 17 26.4	22.3	10.767	+ 26.70	+ 9 15.81	16 17.46	1 10.15	19 34 55.71
16	19 48 29.47	31.19	21 6 33.3	28.9	10.739	27.72	9 37.34	16 17.39	1 10.06	19 38 52.27
17	19 52 46.87	48.65	20 55 15.9	11.1	10.711	28.72	9 58.19	16 17.32	1 9.96	19 42 48.83
18	19 57 3.58	5.41	20 43 34.6	29.6	10.682	29.71	10 18.34	16 17.24	1 9.86	19 46 45.38
19	20 1 19.58	21.46	20 31 29.7	24.3	10.651	30.69	10 37.78	16 17.16	1 9.76	19 50 41.94
20	20 5 34.84	36.77	-20 18 61.5	55.7	10.620	+ 31.67	+ 10 56.49	16 17.08	1 9.66	19 54 38.49
21	20 9 49.35	51.33	20 6 10.5	4.4	10.589	32.60	11 14.44	16 16.99	1 9.56	19 58 35.05
22	20 14 3.09	5.12	19 52 57.0	50.5	10.556	33.53	11 31.62	16 16.90	1 9.46	20 2 31.61
23	20 18 16.06	18.13	19 39 21.2	14.5	10.524	34.44	11 48.02	16 16.81	1 9.35	20 6 28.16
24	20 22 28.22	30.34	19 25 23.6	16.6	10.490	35.35	12 3.63	16 16.71	1 9.25	20 10 24.72
25	20 26 39.59	41.74	-19 10 64.7	57.3	10.457	+ 36.24	+ 12 18.43	16 16.61	1 9.14	20 14 21.27
26	20 30 50.15	52.32	18 56 24.6	16.9	10.423	37.10	12 32.42	16 16.50	1 9.03	20 18 17.83
27	20 34 59.88	62.09	18 41 23.8	15.8	10.389	37.96	12 45.60	16 16.39	1 8.92	20 22 14.38
28	20 39 8.79	11.02	18 25 62.6	54.4	10.355	38.80	12 57.96	16 16.27	1 8.81	20 26 10.94
29	20 43 16.86	19.12	18 10 21.7	13.1	10.320	39.61	13 9.47	16 16.15	1 8.69	20 30 7.49
30	20 47 24.10	26.39	-17 54 21.1	12.2	10.285	+ 40.42	+ 13 20.14	16 16.03	1 8.57	20 34 4.05
31	20 51 30.52	32.82	17 37 61.4	52.1	10.250	41.22	13 29.99	16 15.89	1 8.45	20 38 0.61
Feb. 1	20 55 36.11	38.43	17 21 22.9	13.3	10.216	41.99	13 39.02	16 15.75	1 8.33	20 41 57.16
2	20 59 40.88	43.22	17 4 26.0	16.2	10.182	42.75	13 47.23	16 15.60	1 8.22	20 45 53.71
3	21 3 44.83	47.18	16 47 11.0	1.0	10.148	43.49	13 54.63	16 15.45	1 8.11	20 49 50.27
4	21 7 47.98	50.34	-16 29 38.5	28.2	10.115	+ 44.21	+ 14 1.21	16 15.29	1 8.00	20 53 46.82
5	21 11 50.32	52.69	16 11 48.7	38.2	10.081	44.93	14 6.98	16 15.13	1 7.89	20 57 43.38
6	21 15 51.87	54.25	15 53 42.2	31.4	10.048	45.62	14 11.97	16 14.96	1 7.78	21 1 39.93
7	21 19 52.62	55.01	15 35 19.1	8.1	10.015	46.29	14 16.17	16 14.79	1 7.66	21 5 36.49
8	21 23 52.60	54.99	15 16 40.0	28.8	9.983	46.96	14 19.59	16 14.61	1 7.55	21 9 33.04
9	21 27 51.79	54.18	-14 57 45.4	34.0	9.950	+ 47.59	+ 14 22.22	16 14.43	1 7.43	21 13 29.59
10	21 31 50.21	52.59	14 38 35.7	24.1	9.918	48.21	14 24.08	16 14.25	1 7.32	21 17 26.15
11	21 35 47.86	50.23	14 18 71.2	59.4	9.886	48.82	14 25.16	16 14.06	1 7.21	21 21 22.70
12	21 39 44.74	47.11	13 59 32.4	20.5	9.854	49.40	14 25.49	16 13.87	1 7.10	21 25 19.26
13	21 43 40.87	43.23	13 39 39.6	27.6	9.823	49.98	14 25.06	16 13.68	1 6.99	21 29 15.81
14	21 47 36.25	38.60	-13 19 33.4	21.3	9.792	+ 50.54	+ 14 23.88	16 13.49	1 6.88	21 33 12.36
15	21 51 30.88	33.22	-12 59 14.2	2.0	9.761	+ 51.06	+ 14 21.95	16 13.29	1 6.77	21 37 8.92

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.19 from the sidereal interval.

## FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Meridian.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ' "	"	s	"	m s	"	m s	h m s
Feb. 15	21 51 30.88	33.22	-12 59 14.2	2.0	9.761	+51.06	+14 21.95	16 13.29	1 6.77	21 37 8.92
16	21 55 24.78	27.10	12 38 42.4	30.1	9.731	51.58	14 19.28	16 13.09	1 6.67	21 41 5.47
17	21 59 17.96	20.26	12 17 58.4	46.0	9.701	52.08	14 15.89	16 12.89	1 6.56	21 45 2.02
18	22 3 10.41	12.70	11 56 62.7	50.2	9.671	52.56	14 11.80	16 12.69	1 6.46	21 48 58.58
19	22 7 2.17	4.43	11 35 55.6	43.1	9.642	53.03	14 6.99	16 12.48	1 6.36	21 52 55.13
20	22 10 53.22	55.46	-11 14 37.6	25.1	9.613	+53.47	+14 1.48	16 12.27	1 6.26	21 56 51.68
21	22 14 43.59	45.81	10 52 69.2	56.7	9.585	53.90	13 55.29	16 12.05	1 6.16	22 0 48.24
22	22 18 33.28	35.48	10 31 30.7	18.2	9.557	54.31	13 48.42	16 11.83	1 6.07	22 4 44.79
23	22 22 22.31	24.49	10 9 42.5	30.0	9.529	54.70	13 40.90	16 11.62	1 5.98	22 8 41.34
24	22 26 10.71	12.85	9 47 45.1	32.7	9.503	55.07	13 32.73	16 11.40	1 5.89	22 12 37.90
25	22 29 58.47	60.58	-9 25 38.9	26.6	9.477	+55.43	+13 23.93	16 11.18	1 5.80	22 16 34.45
26	22 33 45.61	47.69	9 3 24.3	12.0	9.452	55.78	13 14.51	16 10.96	1 5.72	22 20 31.00
27	22 37 32.16	34.20	8 40 61.7	49.5	9.428	56.11	13 4.51	16 10.73	1 5.63	22 24 27.55
28	22 41 18.11	20.14	8 18 31.5	19.4	9.404	56.41	12 53.92	16 10.49	1 5.55	22 28 24.11
29	22 45 3.54	5.53	7 55 54.1	42.0	9.381	56.70	12 42.78	16 10.26	1 5.47	22 32 20.66
Mar. 1	22 48 48.42	50.38	-7 32 69.7	57.8	9.359	+56.99	+12 31.11	16 10.02	1 5.40	22 36 17.21
2	22 52 32.79	34.71	7 10 18.9	7.1	9.339	57.24	12 18.92	16 9.78	1 5.33	22 40 13.76
3	22 56 16.68	18.55	6 47 22.0	10.3	9.319	57.49	12 6.25	16 9.53	1 5.26	22 44 10.32
4	23 0 0.10	1.94	6 24 19.3	7.8	9.300	57.73	11 53.12	16 9.28	1 5.19	22 48 6.87
5	23 3 43.08	44.89	6 0 71.2	59.9	9.282	57.94	11 39.56	16 9.02	1 5.13	22 52 3.42
6	23 7 25.65	27.42	-5 37 58.2	47.1	9.266	+58.14	+11 25.57	16 8.76	1 5.07	22 55 59.97
7	23 11 7.83	9.55	5 14 40.5	29.6	9.250	58.33	11 11.19	16 8.50	1 5.01	22 59 56.52
8	23 14 49.62	51.30	4 51 18.6	7.9	9.234	58.49	10 56.43	16 8.24	1 4.95	23 3 53.07
9	23 18 31.06	32.70	4 27 52.8	42.3	9.220	58.65	10 41.31	16 7.97	1 4.90	23 7 49.63
10	23 22 12.16	13.76	4 4 23.6	13.4	9.206	58.79	10 25.86	16 7.71	1 4.84	23 11 46.18
11	23 25 52.94	54.50	-3 40 51.3	41.3	9.193	+58.90	+10 10.10	16 7.44	1 4.79	23 15 42.73
12	23 29 33.42	34.94	3 17 16.2	6.5	9.181	59.01	9 54.04	16 7.17	1 4.74	23 19 39.28
13	23 33 13.63	15.10	2 53 38.9	29.4	9.170	59.10	9 37.69	16 6.90	1 4.70	23 23 35.83
14	23 36 53.56	54.99	2 29 59.6	50.4	9.159	59.17	9 21.07	16 6.64	1 4.66	23 27 32.39
15	23 40 33.26	34.64	2 6 18.8	9.9	9.149	59.23	9 4.21	16 6.37	1 4.62	23 31 28.94
16	23 44 12.73	14.06	-1 42 36.9	28.2	9.140	+59.27	+8 47.12	16 6.09	1 4.59	23 35 25.49
17	23 47 51.98	53.27	1 18 54.1	45.7	9.131	59.29	8 29.84	16 5.82	1 4.56	23 39 22.04
18	23 51 31.04	32.29	0 55 11.0	2.8	9.124	59.30	8 12.35	16 5.55	1 4.54	23 43 18.59
19	23 55 9.93	11.13	0 31 27.9	20.0	9.117	59.29	7 54.68	16 5.28	1 4.52	23 47 15.15
20	23 58 48.65	49.81	-0 7 45.1	37.5	9.111	59.26	7 36.86	16 5.01	1 4.50	23 51 11.70
21	0 2 27.24	28.35	+0 15 57.0	64.3	9.105	+59.23	+7 18.90	16 4.75	1 4.48	23 55 8.25
22	0 6 5.70	6.76	0 39 38.0	44.9	9.100	59.18	7 0.80	16 4.47	1 4.46	23 59 4.80
23	0 9 44.05	45.07	1 3 17.5	24.1	9.096	59.11	6 42.61	16 4.20	1 4.45	0 3 1.35
24	0 13 22.31	23.28	1 26 55.1	61.4	9.093	59.02	6 24.33	16 3.94	1 4.44	0 6 57.90
25	0 17 0.51	1.43	1 50 30.5	36.5	9.091	58.92	6 5.98	16 3.67	1 4.44	0 10 54.45
26	0 20 38.65	39.53	+2 14 3.3	9.0	9.089	+58.80	+5 47.57	16 3.39	1 4.43	0 14 51.01
27	0 24 16.77	17.60	2 37 33.2	38.6	9.088	58.68	5 29.14	16 3.12	1 4.43	0 18 47.56
28	0 27 54.88	55.67	3 0 59.8	64.9	9.088	58.54	5 10.70	16 2.85	1 4.43	0 22 44.11
29	0 31 33.01	33.75	3 24 22.8	27.6	9.089	58.37	4 52.29	16 2.58	1 4.44	0 26 40.66
30	0 35 11.18	11.88	3 47 41.9	46.4	9.092	58.20	4 33.91	16 2.31	1 4.45	0 30 37.21
31	0 38 49.42	50.07	+4 10 56.8	60.9	9.095	+58.02	+4 15.60	16 2.03	1 4.46	0 34 33.77
Apr. 1	0 42 27.75	28.35	+4 34 7.0	10.9	9.099	+57.83	+3 57.38	16 1.75	1 4.47	0 38 30.32

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.18 from the sidereal interval

## FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Meridian.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ' "	"	s	"	m s	' "	m s	h m s
Apr. 1	0 42 27.75	28.35	+ 4 34 7.0	10.9	9.099	+ 57.83	+ 3 57.38	16 1.75	I 4.47	0 38 30.32
2	0 46 6.20	6.75	4 57 12.4	15.9	9.104	57.61	3 39.27	16 1.47	I 4.49	0 42 26.87
3	0 49 44.78	45.29	5 20 12.4	15.7	9.110	57.39	3 21.31	16 1.19	I 4.51	0 46 23.42
4	0 53 23.52	23.98	5 43 6.9	9.9	9.118	57.15	3 3.51	16 0.91	I 4.54	0 50 19.97
5	0 57 2.44	2.86	6 5 55.5	58.2	9.126	56.89	2 45.89	16 0.63	I 4.57	0 54 16.53
6	1 0 41.57	41.94	+ 6 28 38.0	40.3	9.135	+ 56.63	+ 2 28.46	16 0.34	I 4.60	0 58 13.08
7	1 4 20.91	21.24	6 51 13.7	15.8	9.144	56.35	2 11.25	16 0.06	I 4.63	1 2 9.63
8	1 8 0.49	0.78	7 13 42.6	44.4	9.154	56.05	1 54.29	15 59.78	I 4.66	1 6 6.18
9	1 11 40.33	40.58	7 36 4.2	5.8	9.165	55.74	1 37.58	15 59.50	I 4.70	1 10 2.74
10	1 15 20.43	20.64	7 58 18.2	19.5	9.177	55.42	1 21.14	15 59.22	I 4.74	1 13 59.29
11	1 19 0.82	0.99	+ 8 20 24.3	25.3	9.189	+ 55.09	+ 1 4.98	15 58.95	I 4.78	1 17 55.84
12	1 22 41.52	41.64	8 42 22.0	22.8	9.202	54.73	0 49.12	15 58.67	I 4.83	1 21 52.39
13	1 26 22.54	22.61	9 4 11.1	11.6	9.216	54.36	0 33.58	15 58.40	I 4.87	1 25 48.94
14	1 30 3.88	3.92	9 25 51.2	51.5	9.230	53.98	0 18.38	15 58.12	I 4.92	1 29 45.50
15	1 33 45.56	45.57	9 47 22.0	22.0	9.244	53.58	+ 0 3.50	15 57.85	I 4.97	1 33 42.05
16	1 37 27.60	27.57	+ 10 8 43.0	42.9	9.259	+ 53.17	- 0 11.01	15 57.58	I 5.02	1 37 38.60
17	1 41 10.00	9.93	10 29 54.0	53.7	9.274	52.75	0 25.16	15 57.32	I 5.07	1 41 35.16
18	1 44 52.78	52.68	10 50 54.6	54.1	9.290	52.30	0 38.93	15 57.06	I 5.13	1 45 31.71
19	1 48 35.94	35.81	11 11 44.5	43.7	9.307	51.85	0 52.31	15 56.80	I 5.19	1 49 28.26
20	1 52 19.51	19.34	11 32 23.2	22.3	9.324	51.38	1 5.29	15 56.55	I 5.25	1 53 24.81
21	1 56 3.48	3.27	+ 11 52 50.6	49.5	9.341	+ 50.89	- 1 17.88	15 56.30	I 5.31	1 57 21.37
22	1 59 47.87	47.63	12 13 6.1	4.9	9.359	50.39	1 30.05	15 56.05	I 5.38	2 1 17.92
23	2 3 32.68	32.42	12 33 9.5	8.2	9.377	49.89	1 41.79	15 55.80	I 5.44	2 5 14.47
24	2 7 17.94	17.64	12 52 60.6	59.0	9.395	49.37	1 53.08	15 55.56	I 5.51	2 9 11.03
25	2 11 3.65	3.32	13 12 38.8	37.1	9.414	48.82	2 3.92	15 55.31	I 5.58	2 13 7.58
26	2 14 49.83	49.48	+ 13 32 3.9	2.1	9.434	+ 48.27	- 2 14.29	15 55.06	I 5.65	2 17 4.13
27	2 18 36.49	36.11	13 51 15.7	13.8	9.454	47.71	2 24.18	15 54.82	I 5.73	2 21 0.69
28	2 22 23.64	23.24	14 10 13.7	11.8	9.475	47.13	2 33.58	15 54.58	I 5.80	2 24 57.24
29	2 26 11.30	10.87	14 28 57.8	55.7	9.497	46.54	2 42.47	15 54.33	I 5.88	2 28 53.79
30	2 29 59.48	59.03	14 47 27.5	25.3	9.519	45.94	2 50.85	15 54.09	I 5.96	2 32 50.35
May 1	2 33 48.20	47.72	+ 15 5 42.6	40.3	9.541	+ 45.33	- 2 58.67	15 53.85	I 6.04	2 36 46.90
2	2 37 37.46	36.96	15 23 42.8	40.5	9.564	44.69	3 5.96	15 53.61	I 6.12	2 40 43.46
3	2 41 27.27	26.76	15 41 27.8	25.4	9.587	44.05	3 12.72	15 53.37	I 6.20	2 44 40.01
4	2 45 17.66	17.13	15 58 57.2	54.8	9.611	43.40	3 18.90	15 53.14	I 6.28	2 48 36.56
5	2 49 8.61	8.07	16 16 10.9	8.4	9.635	42.73	3 24.50	15 52.90	I 6.36	2 52 33.12
6	2 52 60.14	59.58	+ 16 33 8.4	5.9	9.659	+ 42.05	- 3 29.51	15 52.67	I 6.44	2 56 29.67
7	2 56 52.26	51.68	16 49 49.4	47.0	9.683	41.36	3 33.95	15 52.44	I 6.52	3 0 26.23
8	3 0 44.96	44.37	17 6 13.8	11.3	9.708	40.66	3 37.81	15 52.22	I 6.60	3 4 22.78
9	3 4 38.24	37.65	17 22 21.1	18.6	9.732	39.94	3 41.08	15 51.99	I 6.68	3 8 19.34
10	3 8 32.12	31.52	17 38 11.0	8.6	9.757	39.21	3 43.75	15 51.77	I 6.76	3 12 15.89
11	3 12 26.59	25.98	+ 17 53 43.4	41.0	9.781	+ 38.47	- 3 45.85	15 51.56	I 6.84	3 16 12.4
12	3 16 21.64	21.02	18 8 57.8	55.4	9.806	37.72	3 47.35	15 51.35	I 6.93	3 20 9.06
13	3 20 17.28	16.66	18 23 54.0	51.6	9.830	36.96	3 48.26	15 51.14	I 7.01	3 24 5.55
14	3 24 13.50	12.88	18 38 31.7	29.3	9.854	36.18	3 48.60	15 50.93	I 7.09	3 28 2.11
15	3 28 10.30	9.67	18 52 50.5	48.2	9.878	35.39	3 48.36	15 50.73	I 7.17	3 31 58.67
16	3 32 7.66	7.03	+ 19 6 50.2	48.0	9.902	+ 34.59	- 3 47.56	15 50.53	I 7.25	3 35 55.22
17	3 36 5.58	4.95	+ 19 20 30.6	28.4	9.925	+ 33.77	- 3 46.20	15 50.34	I 7.34	3 39 51.77

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.18 from the sidereal interval.

## FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Meridian.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ' "	"	s	"	m s	' "	m s	h m s
May 17	3 36 5.58	4.95	+19 20 30.6	28.4	9.925	+33.77	-3 46.20	15 50.34	I 7.34	3 39 51.77
18	3 40 4.05	3.43	19 33 51.3	49.2	9.948	32.95	3 44.30	15 50.16	I 7.42	3 43 48.33
19	3 44 3.06	2.44	19 46 52.0	50.0	9.970	32.11	3 41.84	15 49.98	I 7.50	3 47 44.89
20	3 48 2.60	1.99	19 59 32.4	30.5	9.992	31.26	3 38.85	15 49.80	I 7.58	3 51 41.44
21	3 52 2.67	2.07	20 11 52.4	50.6	10.013	30.40	3 35.34	15 49.62	I 7.65	3 55 38.00
22	3 56 3.25	2.66	+20 23 51.8	50.0	10.034	+29.53	-3 31.32	15 49.45	I 7.72	3 59 34.55
23	4 0 4.33	3.75	20 35 30.1	28.4	10.055	28.66	3 26.79	15 49.28	I 7.79	4 3 31.11
24	4 4 5.91	5.35	20 46 47.2	45.6	10.076	27.77	3 21.76	15 49.12	I 7.86	4 7 27.66
25	4 8 7.98	7.43	20 57 42.8	41.3	10.096	26.87	3 16.25	15 48.96	I 7.93	4 11 24.22
26	4 12 10.54	10.00	21 8 16.7	15.4	10.116	25.96	3 10.25	15 48.80	I 8.00	4 15 20.78
27	4 16 13.56	13.04	+21 18 28.8	27.6	10.136	+25.04	-3 3.79	15 48.64	I 8.07	4 19 17.33
28	4 20 17.05	16.55	21 28 18.8	17.6	10.155	24.12	2 56.85	15 48.49	I 8.13	4 23 13.89
29	4 24 20.99	20.51	21 37 46.5	45.4	10.174	23.19	2 49.46	15 48.35	I 8.20	4 27 10.44
30	4 28 25.38	24.92	21 46 51.7	50.7	10.192	22.25	2 41.62	15 48.20	I 8.26	4 31 7.00
31	4 32 30.21	29.78	21 55 34.3	33.3	10.210	21.30	2 33.35	15 48.05	I 8.32	4 35 3.56
June 1	4 36 35.47	35.06	+22 3 54.0	53.1	10.228	+20.34	-2 24.65	15 47.91	I 8.38	4 39 0.11
2	4 40 41.14	40.76	22 11 50.6	49.9	10.244	19.38	2 15.54	15 47.77	I 8.44	4 42 56.67
3	4 44 47.20	46.85	22 19 24.1	23.5	10.260	18.41	2 6.02	15 47.63	I 8.49	4 46 53.22
4	4 48 53.65	53.32	22 26 34.3	33.7	10.276	17.44	1 56.13	15 47.49	I 8.54	4 50 49.78
5	4 53 0.47	0.16	22 33 20.9	20.4	10.291	16.46	1 45.86	15 47.36	I 8.59	4 54 46.34
6	4 57 7.64	7.36	+22 39 43.8	43.4	10.306	+15.47	-1 35.26	15 47.24	I 8.64	4 58 42.89
7	5 1 15.12	14.88	22 45 43.0	42.6	10.319	14.47	1 24.32	15 47.12	I 8.68	5 2 39.45
8	5 5 22.93	22.72	22 51 18.2	17.9	10.331	13.47	1 13.08	15 47.01	I 8.72	5 6 36.01
9	5 9 31.02	30.84	22 56 29.4	29.2	10.342	12.46	1 1.55	15 46.90	I 8.75	5 10 32.56
10	5 13 39.37	39.23	23 1 16.5	16.4	10.353	11.45	0 49.74	15 46.79	I 8.79	5 14 29.12
11	5 17 47.95	47.85	+23 5 39.3	39.2	10.362	+10.44	-0 37.71	15 46.69	I 8.82	5 18 25.67
12	5 21 56.78	56.70	23 9 37.8	37.7	10.371	9.43	0 25.45	15 46.59	I 8.84	5 22 22.23
13	5 26 5.78	5.74	23 13 11.7	11.7	10.378	8.41	0 13.01	15 46.50	I 8.86	5 26 18.79
14	5 30 14.94	14.94	23 16 21.2	21.2	10.385	7.38	-0 0.40	15 46.40	I 8.88	5 30 15.35
15	5 34 24.24	24.28	23 19 6.1	6.1	10.390	6.36	+0 12.35	15 46.33	I 8.90	5 34 11.90
16	5 38 33.65	33.72	+23 21 26.3	26.3	10.394	+5.33	+0 25.20	15 46.26	I 8.91	5 38 8.46
17	5 42 43.14	43.25	23 23 21.8	21.8	10.396	4.30	0 38.14	15 46.19	I 8.92	5 42 5.01
18	5 46 52.68	52.83	23 24 52.6	52.6	10.398	3.27	0 51.12	15 46.13	I 8.93	5 46 1.57
19	5 51 2.25	2.44	23 25 58.5	58.5	10.399	2.23	1 4.14	15 46.07	I 8.94	5 49 58.13
20	5 55 11.82	12.04	23 26 39.7	39.7	10.399	1.20	1 17.15	15 46.02	I 8.94	5 53 54.69
21	5 59 21.36	21.62	+23 26 56.1	56.1	10.397	+0.17	+1 30.14	15 45.97	I 8.94	5 57 51.24
22	6 3 30.86	31.16	23 26 47.6	47.6	10.394	-0.87	1 43.08	15 45.92	I 8.94	6 1 47.80
23	6 7 40.30	40.63	23 26 14.4	14.4	10.391	1.90	1 55.96	15 45.88	I 8.93	6 5 44.36
24	6 11 49.64	50.01	23 25 16.4	16.4	10.387	2.93	2 8.74	15 45.84	I 8.92	6 9 40.91
25	6 15 58.87	59.28	23 23 53.7	53.6	10.383	3.96	2 21.42	15 45.80	I 8.90	6 13 37.47
26	6 20 7.98	8.42	+23 22 6.2	6.0	10.377	-4.99	+2 33.97	15 45.77	I 8.89	6 17 34.03
27	6 24 16.94	17.42	23 19 54.1	53.8	10.370	6.02	2 46.38	15 45.75	I 8.87	6 21 30.58
28	6 28 25.73	26.25	23 17 17.4	17.1	10.362	7.04	2 58.62	15 45.73	I 8.84	6 25 27.14
29	6 32 34.35	34.89	23 14 16.2	15.8	10.354	8.06	3 10.69	15 45.71	I 8.81	6 29 23.70
30	6 36 42.76	43.34	23 10 50.6	50.1	10.346	9.08	3 22.54	15 45.69	I 8.78	6 33 20.25
July 1	6 40 50.95	51.56	+23 7 0.6	0.0	10.336	-10.09	+3 34.17	15 45.67	I 8.75	6 37 16.81
2	6 44 58.90	59.54	+23 2 46.4	45.7	10.326	-11.10	+3 45.56	15 45.66	I 8.71	6 41 13.37

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0<sup>h</sup> 10 from the sidereal interval.

## FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.			Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Meridian.	Sidereal Time of Mean Noon.
	Mean Noon.			Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h	m	s	s	"	s	"	m	s	m	s
July	1	6 40	50.95	51.56	+23 7 0.6	10.336	-10.09	+3 34.17	15 45.67	1 8.75	6 37 16.81
	2	6 44	58.90	59.54	23 2 46.4	10.326	11.10	3 45.56	15 45.66	1 8.71	6 41 13.37
	3	6 49	6.59	7.26	22 58 7.9	10.314	12.10	3 56.69	15 45.65	1 8.67	6 45 9.92
	4	6 53	14.00	14.70	22 53 5.4	10.302	13.10	4 7.55	15 45.64	1 8.63	6 49 6.48
	5	6 57	21.11	21.85	22 47 39.1	10.290	14.09	4 18.10	15 45.64	1 8.59	6 53 3.04
	6	7 1	27.90	28.67	+22 41 49.0	10.276	-15.08	+4 28.34	15 45.65	1 8.54	6 56 59.59
	7	7 5	34.36	35.15	22 35 35.2	10.262	16.07	4 38.24	15 45.66	1 8.49	7 0 56.15
	8	7 9	40.46	41.28	22 28 57.9	10.247	17.04	4 47.79	15 45.67	1 8.43	7 4 52.71
	9	7 13	46.19	47.04	22 21 57.3	10.231	18.01	4 56.96	15 45.69	1 8.37	7 8 49.26
	10	7 17	51.53	52.40	22 14 33.5	10.214	18.97	5 5.74	15 45.72	1 8.31	7 12 45.82
	11	7 21	56.45	57.34	+22 6 46.8	10.196	-19.92	+5 14.11	15 45.75	1 8.25	7 16 42.38
	12	7 26	0.94	1.85	21 58 37.1	10.178	20.87	5 22.04	15 45.79	1 8.19	7 20 38.93
	13	7 30	4.97	5.90	21 50 5.0	10.158	21.81	5 29.51	15 45.83	1 8.12	7 24 35.49
	14	7 34	8.52	9.47	21 41 10.4	10.138	22.74	5 36.51	15 45.88	1 8.06	7 28 32.04
	15	7 38	11.59	12.55	21 31 53.6	10.117	23.66	5 43.01	15 45.93	1 7.99	7 32 28.60
	16	7 42	14.14	15.12	+21 22 14.8	10.095	-24.57	+5 48.98	15 45.99	1 7.92	7 36 25.16
	17	7 46	16.16	17.15	21 12 14.4	10.073	25.47	5 54.47	15 46.05	1 7.85	7 40 21.71
	18	7 50	17.63	18.64	21 1 52.4	10.050	26.36	5 59.39	15 46.12	1 7.77	7 44 18.27
	19	7 54	18.55	19.57	20 51 9.1	10.027	27.25	6 3.74	15 46.20	1 7.70	7 48 14.82
	20	7 58	18.90	19.93	20 40 4.7	10.003	28.12	6 7.54	15 46.28	1 7.62	7 52 11.38
	21	8 2	18.68	19.71	+20 28 39.5	9.979	-28.98	+6 10.75	15 46.36	1 7.54	7 56 7.94
	22	8 6	17.88	18.91	20 16 53.6	9.955	29.83	6 13.38	15 46.45	1 7.46	8 0 4.49
	23	8 10	16.48	17.52	20 4 47.5	9.930	30.68	6 15.44	15 46.54	1 7.38	8 4 1.05
	24	8 14	14.50	15.53	19 52 21.2	9.905	31.51	6 16.90	15 46.63	1 7.30	8 7 57.60
	25	8 18	11.92	12.95	19 39 35.1	9.880	32.33	6 17.75	15 46.73	1 7.21	8 11 54.16
	26	8 22	8.74	9.77	+19 26 29.4	9.856	-33.14	+6 18.03	15 46.83	1 7.12	8 15 50.71
	27	8 26	4.97	6.00	19 13 4.4	9.831	33.94	6 17.70	15 46.93	1 7.03	8 19 47.27
	28	8 30	0.60	1.63	18 59 20.3	9.806	34.73	6 16.78	15 47.04	1 6.95	8 23 43.82
	29	8 33	55.64	56.66	18 45 17.4	9.781	35.50	6 15.25	15 47.15	1 6.86	8 27 40.38
	30	8 37	50.08	51.09	18 30 55.9	9.756	36.27	6 13.14	15 47.25	1 6.78	8 31 36.93
	31	8 41	43.93	44.93	+18 16 16.1	9.732	-37.03	+6 10.43	15 47.37	1 6.69	8 35 33.49
Aug.	1	8 45	37.18	38.17	18 1 18.4	9.707	37.78	6 7.13	15 47.49	1 6.61	8 39 30.04
	2	8 49	29.85	30.83	17 45 63.0	9.682	38.50	6 3.23	15 47.62	1 6.52	8 43 26.60
	3	8 53	21.93	22.89	17 30 30.2	9.658	39.22	5 58.77	15 47.74	1 6.43	8 47 23.15
	4	8 57	13.43	14.37	17 14 40.2	9.634	39.93	5 53.71	15 47.87	1 6.34	8 51 19.71
	5	9 1	4.34	5.27	+16 58 33.4	9.610	-40.63	+5 48.05	15 48.01	1 6.25	8 55 16.26
	6	9 4	54.67	55.58	16 42 10.0	9.586	41.31	5 41.83	15 48.14	1 6.16	8 59 12.81
	7	9 8	44.44	45.32	16 25 30.4	9.562	41.98	5 35.02	15 48.28	1 6.07	9 3 9.37
	8	9 12	33.62	34.49	16 8 34.9	9.537	42.64	5 27.66	15 48.43	1 5.99	9 7 5.92
	9	9 16	22.24	23.09	15 51 23.7	9.514	43.28	5 19.73	15 48.58	1 5.90	9 11 2.48
	10	9 20	10.29	11.11	+15 33 57.3	9.490	-43.91	+5 11.22	15 48.73	1 5.82	9 14 59.03
	11	9 23	57.77	58.57	15 16 15.8	9.467	44.53	5 2.16	15 48.90	1 5.74	9 18 55.59
	12	9 27	44.69	45.46	14 58 19.8	9.443	45.14	4 52.53	15 49.07	1 5.66	9 22 52.14
	13	9 31	31.04	31.78	14 40 9.4	9.420	45.72	4 42.32	15 49.24	1 5.58	9 26 48.69
	14	9 35	16.84	17.55	14 21 44.9	9.397	46.30	4 31.56	15 49.41	1 5.50	9 30 45.25
	15	9 39	2.08	2.76	+14 3 6.7	9.374	-46.87	+4 20.24	15 49.59	1 5.43	9 34 41.80
	16	9 42	46.77	47.42	+13 44 15.3	9.351	-47.42	+4 8.38	15 49.78	1 5.35	9 38 38.36

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.19 from the sidereal interval.



## FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Meridian.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ' "	"	s	"	m s	' "	m s	h m s
Aug. 16	9 42 46.77	47.42	+13 44 15.3	12.0	9.351	-47.42	+ 4 8.38	15 49.78	I 5.35	9 38 38.36
17	9 46 30.93	31.54	13 25 10.8	7.7	9.328	47.95	3 55.99	15 49.97	I 5.28	9 42 34.91
18	9 50 14.55	15.13	13 5 53.6	50.6	9.307	48.48	3 43.06	15 50.16	I 5.21	9 46 31.46
19	9 53 57.66	58.20	12 46 24.0	21.1	9.286	48.99	3 29.62	15 50.35	I 5.14	9 50 28.02
20	9 57 40.27	40.77	12 26 42.3	39.6	9.265	49.48	3 15.67	15 50.55	I 5.07	9 54 24.57
21	10 1 22.38	22.85	+12 6 48.8	46.2	9.245	-49.97	+ 3 1.23	15 50.75	I 5.00	9 58 21.12
22	10 5 4.02	4.44	11 46 43.8	41.5	9.225	50.44	2 46.31	15 50.95	I 4.94	10 2 17.68
23	10 8 45.19	45.58	11 26 27.7	25.6	9.206	50.90	2 30.94	15 51.16	I 4.87	10 6 14.23
24	10 12 25.94	26.28	11 5 60.7	58.7	9.188	51.34	2 15.13	15 51.37	I 4.81	10 10 10.78
25	10 16 6.25	6.55	10 45 23.2	21.4	9.171	51.77	1 58.89	15 51.58	I 4.75	10 14 7.33
26	10 19 46.15	46.41	+10 24 35.4	33.9	9.155	-52.20	+ 1 42.24	15 51.79	I 4.69	10 18 3.89
27	10 23 25.67	25.88	10 3 37.7	36.4	9.139	52.61	1 25.21	15 52.01	I 4.63	10 22 0.44
28	10 27 4.81	4.98	9 42 30.3	29.3	9.124	53.00	1 7.81	15 52.23	I 4.57	10 25 56.99
29	10 30 43.60	43.73	9 21 13.7	12.9	9.109	53.38	0 50.05	15 52.45	I 4.52	10 29 53.54
30	10 34 22.06	22.14	8 59 48.0	47.5	9.095	53.75	0 31.95	15 52.66	I 4.47	10 33 50.10
31	10 38 0.20	0.23	+ 8 38 13.6	13.3	9.082	-54.10	+ 0 13.55	15 52.88	I 4.42	10 37 46.65
Sept. 1	10 41 38.04	38.02	8 16 30.8	30.9	9.071	54.45	- 0 5.15	15 53.10	I 4.37	10 41 43.20
2	10 45 15.60	15.55	7 54 40.1	40.4	9.060	54.78	0 24.15	15 53.33	I 4.33	10 45 39.76
3	10 48 52.90	52.80	7 32 41.5	42.1	9.049	55.10	0 43.39	15 53.56	I 4.29	10 49 36.31
4	10 52 29.97	29.81	7 10 35.4	36.4	9.039	55.40	1 2.88	15 53.79	I 4.25	10 53 32.86
5	10 56 6.80	6.60	+ 6 48 22.3	23.6	9.030	-55.69	- 1 22.59	15 54.02	I 4.21	10 57 29.41
6	10 59 43.42	43.17	6 26 2.4	4.0	9.022	55.97	1 42.52	15 54.26	I 4.17	11 1 25.96
7	11 3 19.85	19.55	6 3 36.1	38.0	9.014	56.22	2 2.63	15 54.50	I 4.14	11 5 22.52
8	11 6 56.10	55.75	5 41 3.7	5.9	9.007	56.47	2 22.93	15 54.74	I 4.12	11 9 19.07
9	11 10 32.20	31.79	5 18 25.5	28.0	9.001	56.71	2 43.40	15 54.98	I 4.10	11 13 15.62
10	11 14 8.14	7.68	+ 4 55 42.0	44.8	8.995	-56.92	- 3 4.00	15 55.24	I 4.08	11 17 12.17
11	11 17 43.93	43.42	4 32 53.3	56.5	8.989	57.12	3 24.75	15 55.49	I 4.06	11 21 8.72
12	11 21 19.61	19.05	4 10 0.0	3.6	8.984	57.31	3 45.62	15 55.75	I 4.05	11 25 5.28
13	11 24 55.18	54.57	3 47 2.3	6.3	8.980	57.49	4 6.59	15 56.01	I 4.04	11 29 1.83
14	11 28 30.65	29.99	3 24 0.7	4.9	8.976	57.65	4 27.67	15 56.27	I 4.03	11 32 58.38
15	11 32 6.06	5.34	+ 3 0 55.4	60.0	8.974	-57.79	- 4 48.82	15 56.54	I 4.02	11 36 54.93
16	11 35 41.40	40.64	2 37 46.7	51.6	8.972	57.93	5 10.01	15 56.81	I 4.01	11 40 51.48
17	11 39 16.72	15.90	2 14 35.0	40.3	8.971	58.04	5 31.24	15 57.07	I 4.01	11 44 48.04
18	11 42 52.02	51.15	1 51 20.8	26.4	8.971	58.14	5 52.48	15 57.34	I 4.01	11 48 44.59
19	11 46 27.34	26.41	1 28 4.1	10.1	8.972	58.24	6 13.72	15 57.61	I 4.02	11 52 41.14
20	11 50 2.67	1.69	+ 1 4 45.4	51.8	8.974	-58.31	- 6 34.92	15 57.88	I 4.03	11 56 37.69
21	11 53 38.06	37.03	0 41 25.1	31.8	8.977	58.37	6 56.08	15 58.15	I 4.04	12 0 34.24
22	11 57 13.54	12.45	+ 0 18 3.4	10.5	8.980	58.43	7 17.16	15 58.43	I 4.05	12 4 30.79
23	12 0 49.11	47.97	- 0 5 19.3	11.9	8.984	58.46	7 38.12	15 58.70	I 4.07	12 8 27.34
24	12 4 24.81	23.61	0 28 42.7	34.9	8.990	58.48	7 58.97	15 58.98	I 4.09	12 12 23.90
25	12 7 60.65	59.41	- 0 51 66.4	58.3	8.997	-58.49	- 8 19.68	15 59.25	I 4.11	12 16 20.45
26	12 11 36.66	35.37	1 15 30.2	21.8	9.005	58.49	8 40.22	15 59.52	I 4.14	12 20 17.00
27	12 15 12.87	11.52	1 38 53.7	45.0	9.013	58.46	9 0.56	15 59.79	I 4.17	12 24 13.55
28	12 18 49.29	47.89	2 2 16.6	7.5	9.022	58.43	9 20.68	16 0.06	I 4.20	12 28 10.10
29	12 22 25.96	24.51	2 25 38.4	29.0	9.033	58.39	9 40.57	16 0.33	I 4.24	12 32 6.66
30	12 26 2.89	1.39	- 2 48 59.1	49.4	9.044	-58.33	-10 0.19	16 0.60	I 4.28	12 36 3.21
Oct. 1	12 29 40.10	38.56	- 3 12 18.1	8.1	9.057	-58.25	-10 19.52	16 0.87	I 4.32	12 39 59.76

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.18 from the sidereal interval.

## FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Meridian.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ' "	"	s	"	m s	"	m s	h m s
Oct. 1	12 29 40.10	38.56	- 3 12 18.1	8.1	9.057	-58.25	-10 19.52	16 0.87	1 4.32	12 39 59.76
2	12 33 17.63	16.03	3 35 35.0	24.7	9.070	58.16	10 38.54	16 1.14	1 4.36	12 43 56.31
3	12 36 55.49	53.83	3 58 49.7	39.1	9.084	58.05	10 57.24	16 1.41	1 4.41	12 47 52.86
4	12 40 33.70	31.99	4 21 61.6	50.8	9.099	57.93	11 15.59	16 1.68	1 4.46	12 51 49.41
5	12 44 12.27	10.52	4 44 70.5	59.4	9.115	57.80	11 33.57	16 1.95	1 4.51	12 55 45.97
6	12 47 51.23	49.43	- 5 8 16.0	4.6	9.132	-57.65	-11 51.16	16 2.23	1 4.56	12 59 42.52
7	12 51 30.60	28.75	5 31 17.6	6.0	9.149	57.48	12 8.33	16 2.50	1 4.62	13 3 39.07
8	12 55 10.38	8.48	5 54 15.1	3.3	9.167	57.30	12 25.10	16 2.78	1 4.68	13 7 35.62
9	12 58 50.59	48.65	6 16 68.0	56.0	9.185	57.11	12 41.44	16 3.05	1 4.75	13 11 32.18
10	13 2 31.25	29.27	6 39 56.0	43.7	9.204	56.89	12 57.34	16 3.33	1 4.82	13 15 28.73
11	13 6 12.38	10.35	- 7 2 38.4	26.0	9.223	-56.66	-13 12.77	16 3.62	1 4.89	13 19 25.28
12	13 9 53.97	51.90	7 25 15.2	2.6	9.243	56.40	13 27.73	16 3.89	1 4.97	13 23 21.83
13	13 13 36.06	33.95	7 47 45.8	33.0	9.264	56.14	13 42.18	16 4.17	1 5.05	13 27 18.38
14	13 17 18.66	16.51	8 9 69.9	57.0	9.286	55.86	13 56.13	16 4.45	1 5.13	13 31 14.94
15	13 20 61.78	59.59	8 32 27.1	14.0	9.308	55.56	14 9.56	16 4.74	1 5.21	13 35 11.49
16	13 24 45.45	43.22	- 8 54 36.9	23.6	9.331	-55.25	-14 22.46	16 5.02	1 5.29	13 39 8.04
17	13 28 29.68	27.41	9 16 39.0	25.6	9.355	54.92	14 34.79	16 5.30	1 5.38	13 43 4.59
18	13 32 14.49	12.18	9 38 33.0	19.6	9.379	54.57	14 46.54	16 5.58	1 5.46	13 47 1.15
19	13 35 59.89	57.55	10 0 18.6	5.1	9.405	54.21	14 57.69	16 5.85	1 5.55	13 50 57.70
20	13 39 45.91	43.53	10 21 55.3	41.8	9.431	53.84	15 8.24	16 6.12	1 5.64	13 54 54.25
21	13 43 32.55	30.15	-10 43 22.8	9.2	9.458	-53.44	-15 18.15	16 6.40	1 5.73	13 58 50.81
22	13 47 19.87	17.43	11 4 40.8	27.1	9.485	53.04	15 27.40	16 6.67	1 5.83	14 2 47.36
23	13 51 7.84	5.38	11 25 48.6	34.9	9.513	52.62	15 35.98	16 6.94	1 5.93	14 6 43.91
24	13 54 56.51	54.01	11 46 46.1	32.4	9.543	52.17	15 43.87	16 7.20	1 6.03	14 10 40.46
25	13 58 45.88	43.35	12 7 32.9	19.2	9.573	51.72	15 51.06	16 7.47	1 6.14	14 14 37.02
26	14 2 35.97	33.42	-12 27 68.5	54.8	9.603	-51.25	-15 57.54	16 7.73	1 6.25	14 18 33.57
27	14 6 26.81	24.23	12 48 32.5	18.9	9.634	50.75	16 3.26	16 7.98	1 6.36	14 22 30.12
28	14 10 18.40	15.80	13 8 44.6	31.1	9.666	50.25	16 8.23	16 8.23	1 6.46	14 26 26.68
29	14 14 10.77	8.15	13 28 44.5	31.0	9.698	49.73	16 12.43	16 8.48	1 6.57	14 30 23.23
30	14 18 3.92	1.28	13 48 31.6	18.3	9.731	49.19	16 15.84	16 8.73	1 6.68	14 34 19.78
31	14 21 57.87	55.21	-14 7 65.6	52.4	9.765	-48.64	-16 18.45	16 8.98	1 6.79	14 38 16.34
Nov. 1	14 25 52.63	49.96	14 27 26.1	13.0	9.798	48.06	16 20.24	16 9.22	1 6.90	14 42 12.89
2	14 29 48.21	45.53	14 46 32.7	19.8	9.833	47.47	16 21.23	16 9.46	1 7.02	14 46 9.45
3	14 33 44.62	41.93	15 5 25.1	12.3	9.867	46.88	16 21.38	16 9.70	1 7.14	14 50 6.00
4	14 37 41.86	39.16	15 23 62.6	50.0	9.902	46.25	16 20.71	16 9.94	1 7.25	14 54 2.56
5	14 41 39.94	37.23	-15 42 25.1	12.6	9.937	-45.61	-16 19.20	16 10.18	1 7.37	14 57 59.11
6	14 45 38.86	36.15	16 0 31.9	19.7	9.972	44.95	16 16.85	16 10.42	1 7.49	15 1 55.66
7	14 49 38.62	35.91	16 18 22.8	10.7	10.007	44.27	16 13.64	16 10.65	1 7.61	15 5 52.22
8	14 53 39.22	36.51	16 35 57.2	45.5	10.042	43.59	16 9.60	16 10.88	1 7.73	15 9 48.77
9	14 57 40.65	37.95	16 53 14.9	3.3	10.077	42.88	16 4.74	16 11.11	1 7.85	15 13 45.33
10	15 1 42.93	40.23	-17 10 15.2	4.0	10.112	-42.15	-15 59.03	16 11.35	1 7.97	15 17 41.88
11	15 5 46.04	43.35	17 26 57.8	46.9	10.147	41.40	15 52.47	16 11.59	1 8.09	15 21 38.44
12	15 9 49.98	47.30	17 43 22.4	11.7	10.181	40.64	15 45.09	16 11.82	1 8.21	15 25 34.99
13	15 13 54.75	52.09	17 59 28.6	18.1	10.216	39.86	15 36.89	16 12.05	1 8.33	15 29 31.54
14	15 17 60.36	57.71	18 15 15.8	5.6	10.250	39.07	15 27.85	16 12.26	1 8.45	15 33 28.10
15	15 22 6.79	4.17	-18 30 43.6	33.9	10.285	-38.25	-15 17.98	16 12.47	1 8.57	15 37 24.66
16	15 26 14.05	11.45	-18 45 51.9	42.5	10.319	-37.43	-15 7.27	16 12.69	1 8.69	15 41 21.21

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0°.18 from the sidereal interval.

## FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Meridian.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ' "	"	s	"	m s	"	m s	h m s
Nov. 16	15 26 14.05	11.45	-18 45 51.9	42.5	10.319	-37.43	-15 7.27	16 12.69	1 8.69	15 41 21.21
17	15 30 22.13	19.55	19 0 40.1	31.0	10.353	36.59	14 55.76	16 12.90	1 8.80	15 45 17.77
18	15 34 31.02	28.47	19 14 67.9	59.1	10.387	35.72	14 43.42	16 13.11	1 8.92	15 49 14.32
19	15 38 40.74	38.21	19 29 14.8	6.4	10.421	34.85	14 30.27	16 13.32	1 9.03	15 53 10.88
20	15 42 51.25	48.76	19 42 60.6	52.5	10.455	33.96	14 16.33	16 13.52	1 9.14	15 57 7.43
21	15 47 2.57	0.12	-19 56 24.9	17.1	10.488	-33.06	-14 1.55	16 13.71	1 9.25	16 1 3.99
22	15 51 14.69	12.27	20 9 27.3	19.9	10.521	32.14	13 45.99	16 13.90	1 9.36	16 5 0.54
23	15 55 27.60	25.22	20 22 7.4	0.4	10.554	31.21	13 29.66	16 14.09	1 9.47	16 8 57.10
24	15 59 41.29	38.95	20 34 25.0	18.3	10.587	30.25	13 12.53	16 14.27	1 9.57	16 12 53.66
25	16 3 55.75	53.46	20 46 19.6	13.3	10.619	29.29	12 54.62	16 14.45	1 9.68	16 16 50.21
26	16 8 10.97	8.73	-20 57 51.0	45.1	10.650	-28.32	-12 35.95	16 14.62	1 9.78	16 20 46.77
27	16 12 26.95	24.76	21 8 58.9	53.3	10.681	27.31	12 16.54	16 14.78	1 9.88	16 24 43.32
28	16 16 43.66	41.52	21 19 42.9	37.6	10.712	26.33	11 56.40	16 14.94	1 9.98	16 28 39.88
29	16 20 61.10	59.01	21 29 62.7	57.8	10.741	25.32	11 35.51	16 15.09	1 10.08	16 32 36.44
30	16 25 19.23	17.21	21 39 58.1	53.5	10.770	24.30	11 13.93	16 15.24	1 10.17	16 36 32.99
Dec. 1	16 29 38.06	36.10	-21 49 28.6	24.4	10.798	-23.25	-10 51.66	16 15.40	1 10.26	16 40 29.55
2	16 33 57.55	55.65	21 58 34.1	30.2	10.826	22.20	10 28.74	16 15.54	1 10.34	16 44 26.11
3	16 38 17.67	15.84	22 7 14.3	10.8	10.851	21.14	10 5.17	16 15.68	1 10.42	16 48 22.66
4	16 42 38.41	36.65	22 15 28.8	25.6	10.876	20.07	9 40.99	16 15.82	1 10.50	16 52 19.22
5	16 46 59.74	58.04	22 23 17.6	14.6	10.900	18.99	9 16.20	16 15.95	1 10.57	16 56 15.78
6	16 51 21.62	20.00	-22 30 40.2	37.5	10.923	-17.89	-8 50.87	16 16.08	1 10.64	17 0 12.33
7	16 55 44.03	42.49	22 37 36.4	34.0	10.944	16.79	8 25.01	16 16.21	1 10.71	17 4 8.89
8	17 0 6.92	5.46	22 44 6.0	3.9	10.964	15.68	7 58.66	16 16.34	1 10.78	17 8 5.45
9	17 4 30.28	28.89	22 50 8.8	7.0	10.981	14.56	7 31.85	16 16.45	1 10.85	17 12 2.00
10	17 8 54.06	52.76	22 55 44.6	43.0	10.999	13.43	7 4.62	16 16.56	1 10.91	17 15 58.56
11	17 13 18.24	17.02	-23 0 53.2	51.8	11.015	-12.29	-6 37.00	16 16.68	1 10.96	17 19 55.12
12	17 17 42.78	41.64	23 5 34.4	33.3	11.030	11.14	6 9.01	16 16.79	1 11.01	17 23 51.68
13	17 22 7.66	6.60	23 9 48.2	47.2	11.043	9.99	5 40.70	16 16.90	1 11.05	17 27 48.23
14	17 26 32.82	31.86	23 13 34.2	33.4	11.054	8.84	5 12.08	16 17.00	1 11.09	17 31 44.79
15	17 30 58.26	57.38	23 16 52.4	51.8	11.065	7.68	4 43.19	16 17.10	1 11.13	17 35 41.35
16	17 35 23.93	23.14	-23 19 42.7	42.2	11.074	-6.52	-4 14.06	16 17.19	1 11.16	17 39 37.91
17	17 39 49.80	49.10	23 22 5.0	4.6	11.081	5.35	3 44.73	16 17.28	1 11.19	17 43 34.46
18	17 44 15.84	15.23	23 23 59.2	58.9	11.087	4.17	3 15.25	16 17.36	1 11.21	17 47 31.02
19	17 48 42.01	41.49	23 25 25.2	25.1	11.093	3.00	2 45.62	16 17.43	1 11.23	17 51 27.58
20	17 53 8.29	7.86	23 26 23.0	23.0	11.097	1.82	2 15.88	16 17.50	1 11.24	17 55 24.14
21	17 57 34.65	34.31	-23 26 52.6	52.6	11.099	-0.65	-1 46.08	16 17.56	1 11.25	17 59 20.69
22	18 2 1.04	0.80	23 26 53.8	53.8	11.100	+0.53	1 16.23	16 17.62	1 11.26	18 3 17.25
23	18 6 27.45	27.30	23 26 26.8	26.8	11.100	1.71	0 46.36	16 17.67	1 11.26	18 7 13.81
24	18 10 53.86	53.79	23 25 31.5	31.5	11.099	2.89	-0 16.52	16 17.72	1 11.26	18 11 10.36
25	18 15 20.21	20.24	23 24 7.9	7.9	11.096	4.07	+0 13.28	16 17.76	1 11.25	18 15 6.92
26	18 19 46.49	46.61	-23 22 16.1	16.1	11.093	+5.24	+0 43.02	16 17.78	1 11.24	18 19 3.48
27	18 24 12.66	12.88	23 19 56.1	56.0	11.088	6.42	1 12.66	16 17.80	1 11.22	18 23 0.04
28	18 28 38.70	39.00	23 17 8.0	7.8	11.082	7.59	1 42.16	16 17.82	1 11.19	18 26 56.59
29	18 33 4.58	4.97	23 13 51.9	51.7	11.074	8.76	2 11.48	16 17.84	1 11.16	18 30 53.15
30	18 37 30.25	30.74	23 10 7.9	7.6	11.065	9.92	2 40.60	16 17.85	1 11.13	18 34 49.71
31	18 41 55.70	56.27	-23 5 55.9	55.3	11.055	+11.08	+3 9.50	16 17.85	1 11.09	18 38 46.26
32	18 46 20.87	21.54	-23 1 16.3	15.6	11.043	+12.23	+3 38.11	16 17.85	1 11.04	18 42 42.82

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.19 from the sidereal interval.

AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.										
Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ' "	"	s	' "	' "	
Jan. 1	10 59.62	2.516	5 41 9.29	161.21	+ 18 23 19.4	+ 54.9	72.33	16 25.5	60 11.1	I. S.
2	12 0.66	2.559	6 46 18.22	163.77	18 4 4.3	- 152.4	72.92	16 34.7	60 44.5	I. II. S.
3	13 1.84	2.529	7 51 35.81	161.98	16 22 28.2	- 351.7	72.52	16 38.7	60 59.4	II. S.
4	14 1.58	2.443	8 55 26.75	156.84	13 27 28.7	- 515.6	71.35	16 37.4	60 54.7	II. S.
5	14 58.91	2.333	9 56 52.44	150.21	9 37 0.4	- 627.5	69.82	16 31.3	60 32.2	II. S.
6	15 53.59	2.226	10 55 38.90	143.81	+ 5 12 50.5	- 684.4	68.32	16 21.4	59 55.9	II. S.
7	16 45.96	2.142	11 52 6.25	138.73	+ 0 36 7.8	- 691.6	67.11	16 9.3	59 11.4	II. S.
8	17 36.65	2.087	12 46 52.37	135.40	- 3 54 56.0	- 657.6	66.30	15 56.2	58 23.4	II. S.
9	18 26.35	2.059	13 40 39.04	133.74	- 8 5 36.3	- 590.9	65.87	15 43.2	57 35.8	II. S.
10	19 15.66	2.053	14 34 2.43	133.37	- 11 44 8.8	- 498.0	65.75	15 31.1	56 51.4	II. S.
11	20 4.99	2.059	15 27 26.89	133.72	- 14 41 13.2	- 384.4	65.79	15 20.4	56 11.9	II. S.
12	20 54.49	2.065	16 21 1.39	134.10	- 16 49 39.0	- 255.7	65.81	15 11.0	55 37.6	II. S.
13	21 44.03	2.061	17 14 38.90	133.88	- 18 4 37.3	- 118.2	65.69	15 3.1	55 8.6	II. S.
14	22 33.30	2.041	18 7 59.42	132.65	- 18 24 2.9	+ 20.7	65.32	14 56.6	54 44.7	II. S.
15	23 21.85	2.002	19 0 36.80	130.31	- 17 48 53.7	153.5	64.67	14 51.3	54 25.5	
17	0 9.28	1.949	19 52 7.18	127.13	- 16 23 2.5	+ 273.2	63.84	14 47.4	54 10.9	
18	0 55.36	1.891	20 42 16.20	123.62	- 14 12 41.9	375.3	62.94	14 44.8	54 1.4	
19	1 40.07	1.837	21 31 2.78	120.36	- 11 25 29.5	457.3	62.11	14 43.7	53 57.3	I. S.
20	2 23.62	1.795	22 18 39.49	117.88	- 8 9 38.1	518.6	61.51	14 44.3	53 59.6	I. S.
21	3 6.42	1.775	23 5 30.76	116.64	- 4 33 20.3	559.6	61.23	14 46.9	54 9.1	I. S.
22	3 49.02	1.780	23 52 10.36	116.96	- 0 44 36.2	+ 580.8	61.39	14 51.8	54 27.1	I. S.
23	4 32.10	1.816	0 39 19.09	119.10	+ 3 8 35.3	581.6	62.03	14 59.2	54 54.2	I. S.
24	5 16.43	1.881	1 27 42.60	123.20	6 57 47.6	560.3	63.15	15 9.2	55 30.9	I. S.
25	6 2.79	1.985	2 18 8.43	129.26	10 33 22.8	512.7	64.75	15 21.8	56 16.9	I. S.
26	6 51.93	2.114	3 11 21.11	137.02	13 43 46.5	433.4	66.72	15 36.5	57 11.1	I. S.
27	7 44.38	2.259	4 7 53.44	145.75	+ 16 15 5.8	+ 316.6	68.84	15 52.8	58 10.8	I. S.
28	8 40.29	2.398	5 7 54.00	154.11	17 51 43.9	+ 160.1	70.80	16 9.3	59 11.7	I. S.
29	9 39.20	2.503	6 10 54.42	160.43	18 18 42.6	- 29.7	72.22	16 24.7	60 8.1	I. S.
30	10 39.95	2.549	7 15 46.43	163.23	17 25 54.0	- 234.7	72.82	16 37.0	60 53.2	I. S.
31	11 41.03	2.530	8 20 57.82	162.09	15 12 28.7	- 427.7	72.53	16 44.6	61 21.0	I. S.
Feb. 1	12 41.00	2.461	9 25 2.35	157.90	+ 11 48 51.8	- 581.7	71.54	16 46.3	61 27.2	II. S.
2	13 38.96	2.367	10 27 5.57	152.26	7 34 34.0	- 679.4	70.23	16 41.9	61 11.2	II. S.
3	14 34.63	2.274	11 26 51.69	146.68	+ 2 53 20.7	- 716.8	68.93	16 32.3	60 35.9	II. S.
4	15 28.25	2.198	12 24 34.56	142.10	- 1 51 38.3	- 699.9	67.88	16 19.0	59 46.7	II. S.
5	16 20.31	2.144	13 20 43.11	138.84	- 6 20 46.5	- 639.5	67.12	16 3.5	58 50.0	II. S.
6	17 11.33	2.110	14 15 48.85	136.81	- 10 18 59.1	- 547.0	66.64	15 47.5	57 51.7	II. S.
7	18 1.72	2.091	15 10 17.21	135.65	- 13 35 24.2	- 432.1	66.37	15 32.5	56 56.5	II. S.
8	18 51.73	2.077	16 4 22.87	134.84	- 16 2 42.8	- 302.6	66.14	15 19.1	56 7.3	II. S.
9	19 41.41	2.061	16 58 8.19	133.88	- 17 36 31.8	- 165.6	65.86	15 7.9	55 26.0	II. S.
10	20 30.61	2.037	17 51 24.74	132.41	- 18 15 7.4	- 27.5	65.42	14 58.9	54 53.0	II. S.
11	21 19.08	2.001	18 43 57.51	130.22	- 17 59 15.0	+ 105.6	64.78	14 52.0	54 28.1	II. S.
12	22 6.56	1.955	19 35 30.64	127.48	- 16 51 59.8	228.4	64.00	14 47.3	54 10.7	II. N.
13	22 52.86	1.904	20 25 52.96	124.39	- 14 58 27.1	336.4	63.14	14 44.4	54 0.1	II. N.
14	23 37.94	1.854	21 15 1.88	121.41	- 12 25 14.3	426.4	62.32	14 43.2	53 55.6	
16	0 21.93	1.813	22 3 4.80	118.95	- 9 19 59.9	+ 496.4	61.66	14 43.5	53 56.6	

## AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ' "	"	s	' "	' "	
Feb. 16	0 21.93	1.813	22 3 4.80	118.95	- 9 19 59.9	+ 496.4	61.66	14 43.5	53 56.6	
17	1 5.10	1.787	22 50 18.83	117.39	- 5 50 54.2	545.5	61.26	14 45.2	54 3.1	
18	1 47.88	1.781	23 37 9.14	117.03	- 2 6 23.3	573.4	61.21	14 48.6	54 15.2	I. S.
19	2 30.79	1.799	0 24 7.32	118.08	+ 1 44 58.3	579.7	61.55	14 53.5	54 33.2	I. S.
20	3 14.43	1.843	1 11 49.66	120.72	5 34 20.9	563.3	62.32	15 0.2	54 57.8	I. S.
21	3 59.46	1.914	2 0 54.88	124.99	+ 9 12 22.2	+ 522.5	63.51	15 8.8	55 29.7	I. S.
22	4 46.49	2.010	2 52 1.41	130.79	12 28 44.1	454.4	65.07	15 19.6	56 8.9	I. S.
23	5 36.09	2.126	3 45 42.07	137.75	15 11 53.5	355.9	66.86	15 32.2	56 55.4	I. S.
24	6 28.58	2.248	4 42 16.56	145.13	17 9 5.8	224.6	68.70	15 46.6	57 47.9	I. S.
25	7 23.92	2.360	5 41 42.73	151.84	18 7 21.3	+ 61.9	70.31	16 1.7	58 43.6	I. S.
26	8 21.61	2.441	6 43 30.00	156.68	+ 17 55 33.1	- 123.6	71.41	16 16.7	59 38.5	I. N. S.
27	9 20.70	2.476	7 46 41.95	158.81	16 27 37.1	- 315.3	71.84	16 29.8	60 26.8	I. N.
28	10 20.07	2.465	8 50 10.42	158.13	13 45 32.2	- 490.3	71.62	16 39.6	61 2.6	I. N.
29	11 18.73	2.419	9 52 55.81	155.39	10 0 34.7	- 626.3	70.93	16 44.4	61 20.3	I. N.
Mar. 1	12 16.07	2.358	10 54 22.14	151.73	5 31 47.8	- 707.6	70.04	16 43.4	61 16.8	II. S.
2	13 11.93	2.298	11 54 19.47	148.11	+ 0 4- 31.1	- 728.7	69.18	16 36.7	60 52.1	II. S.
3	14 6.45	2.248	12 52 56.40	145.09	- 4 3 45.3	- 693.8	68.50	16 25.2	60 9.6	II. S.
4	14 59.91	2.209	13 50 29.36	142.76	- 8 26 31.5	- 613.3	67.99	16 10.3	59 15.1	II. S.
5	15 52.56	2.179	14 47 13.22	140.94	- 12 10 0.9	- 499.7	67.60	15 53.8	58 14.8	II. S.
6	16 44.51	2.150	15 43 15.46	139.24	- 15 3 35.6	- 365.6	67.23	15 37.5	57 14.8	II. S.
7	17 35.74	2.116	16 38 34.52	137.29	- 17 1 19.5	- 222.1	66.77	15 22.5	56 19.6	II. S.
8	18 26.11	2.078	17 33 1.21	134.85	- 18 1 15.2	- 78.0	66.16	15 9.6	55 32.3	II. S.
9	19 15.39	2.028	18 26 23.11	131.90	- 18 4 33.3	+ 60.0	65.38	14 59.3	54 54.5	II. N.
10	20 3.42	1.973	19 18 29.24	128.58	- 17 14 43.9	186.9	64.47	14 51.7	54 26.7	II. N.
11	20 50.11	1.917	20 9 14.42	125.21	- 15 36 58.7	299.3	63.52	14 46.8	54 8.8	II. N.
12	21 35.49	1.866	20 58 41.37	122.12	- 13 17 33.1	+ 394.9	62.64	14 44.4	53 59.9	II. N.
13	22 19.75	1.825	21 47 1.11	119.66	- 10 23 28.7	472.3	61.92	14 44.2	53 59.0	II. N.
14	23 3.21	1.790	22 34 32.03	118.10	- 7 2 17.6	530.2	61.46	14 45.8	54 4.9	II. N.
15	23 46.26	1.792	23 21 38.60	117.66	- 3 22 1.8	567.5	61.31	14 49.0	54 16.5	
17	0 29.38	1.805	0 8 49.48	118.47	+ 0 28 45.8	582.6	61.52	14 53.4	54 33.1	
18	1 13.09	1.841	0 56 36.25	120.64	+ 4 20 56.0	+ 574.1	62.13	14 59.1	54 53.9	I. S.
19	1 57.95	1.900	1 45 31.32	124.17	8 4 36.3	539.8	63.10	15 5.9	55 18.8	I. S.
20	2 44.45	1.978	2 36 5.47	128.87	11 29 7.3	478.0	64.39	15 13.8	55 48.0	I. S.
21	3 33.01	2.071	3 28 44.04	134.46	14 23 6.2	387.1	65.89	15 22.9	56 21.3	I. S.
22	4 23.90	2.169	4 23 41.95	140.38	16 34 43.6	266.4	67.44	15 33.1	56 58.8	I. S.
23	5 17.08	2.260	5 20 58.15	145.83	+ 17 52 32.1	+ 118.5	68.83	15 44.4	57 39.9	I. S.
24	6 12.22	2.330	6 20 12.10	150.04	18 6 46.5	- 50.0	69.87	15 56.2	58 23.4	I. N.
25	7 8.68	2.369	7 20 45.79	152.41	17 11 16.7	- 227.8	70.42	16 8.2	59 7.2	I. N.
26	8 5.70	2.377	8 21 52.63	152.84	15 5 20.9	- 399.3	70.48	16 19.1	59 47.6	I. N.
27	9 2.56	2.359	9 22 50.31	151.77	11 54 55.5	- 547.4	70.15	16 28.0	60 20.2	I. N.
28	9 58.82	2.328	10 23 11.45	149.93	+ 7 52 36.6	- 656.5	69.66	16 33.6	60 40.6	I. N.
29	10 54.31	2.297	11 22 46.96	148.07	+ 3 16 26.1	- 715.3	69.16	16 34.8	60 44.9	I. N.
30	11 49.14	2.273	12 21 42.36	146.63	- 1 32 17.5	- 719.0	68.78	16 31.0	60 31.2	I. N.
31	12 43.50	2.258	13 20 9.46	145.69	- 6 11 37.8	- 669.3	68.56	16 22.7	60 0.6	II. S.
Apr. 1	13 37.55	2.246	14 18 17.56	144.99	- 10 21 38.2	- 574.0	68.43	16 10.6	59 16.3	II. S.

## AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ' "	"	s	"	"	
Apr. 1	13 37.55	2.246	14 18 17.56	144.99	- 10 21 38.2	- 574.0	68.43	16 10.6	59 16.3	II. S.
2	14 31.28	2.230	15 16 6.80	144.04	- 13 46 26.4	- 445.5	68.25	15 56.1	58 23.0	II. S.
3	15 24.51	2.203	16 13 25.63	142.38	- 16 15 29.3	- 297.6	67.90	15 40.7	57 26.6	II. S.
4	16 16.88	2.159	17 9 53.18	139.75	- 17 43 46.0	- 143.8	67.31	15 25.8	56 32.1	II. S.
5	17 8.00	2.099	18 5 5.65	136.16	- 18 11 10.0	+ 5.1	66.47	15 12.7	55 43.5	II. N.
6	17 57.56	2.029	18 58 43.69	131.95	- 17 41 17.0	+ 141.7	65.42	15 1.8	55 3.7	II. N.
7	18 45.39	1.957	19 50 38.03	127.61	- 16 19 59.7	261.8	64.28	14 53.7	54 34.0	II. N.
8	19 31.55	1.891	20 40 51.71	123.65	- 14 14 18.3	363.6	63.21	14 48.5	54 15.1	II. N.
9	20 16.28	1.839	21 29 39.09	120.49	- 11 31 33.6	447.0	62.32	14 46.3	54 6.9	II. N.
10	20 59.95	1.805	22 17 23.47	118.43	- 8 19 8.2	512.0	61.71	14 46.7	54 8.5	II. N.
11	21 43.07	1.792	23 4 34.31	117.71	- 4 44 30.3	+ 557.9	61.45	14 49.5	54 18.6	II. N.
12	22 26.19	1.804	23 51 44.80	118.41	- 0 55 31.2	583.4	61.58	14 54.1	54 35.8	II. N.
13	23 9.88	1.840	0 39 29.80	120.58	+ 2 59 13.1	586.1	62.11	15 0.3	54 58.5	
14	23 54.71	1.899	1 28 23.76	124.14	6 49 59.5	563.0	63.04	15 7.6	55 25.0	
16	0 41.21	1.978	2 18 57.74	128.87	10 25 49.1	510.9	64.28	15 15.5	55 54.1	
17	1 29.76	2.069	3 11 35.40	134.36	+ 13 34 32.2	+ 427.3	65.72	15 23.8	56 24.4	I. S.
18	2 20.55	2.163	4 6 27.73	139.97	16 3 25.4	311.9	67.18	15 32.2	56 55.3	I. S.
19	3 13.46	2.244	5 3 27.92	144.88	17 40 17.7	168.1	68.45	15 40.6	57 26.2	I. S.
20	4 8.06	2.300	6 2 9.37	148.29	18 15 11.5	+ 3.7	69.35	15 48.9	57 56.7	I. N.
21	5 3.64	2.325	7 1 49.91	149.75	17 42 9.4	- 169.2	69.75	15 57.1	58 26.5	I. N.
22	5 59.43	2.319	8 1 42.55	149.35	+ 16 0 33.5	- 336.6	69.68	16 4.7	58 54.6	I. N.
23	6 54.77	2.291	9 1 8.93	147.69	13 15 29.8	- 484.4	69.27	16 11.5	59 19.7	I. N.
24	7 49.34	2.257	9 59 48.74	145.62	9 37 14.6	- 600.8	68.73	16 17.0	59 39.5	I. N.
25	8 43.14	2.228	10 57 41.86	143.91	5 20 10.1	- 677.2	68.26	16 20.2	59 51.7	I. N.
26	9 36.41	2.214	11 55 3.55	143.05	+ 0 41 33.5	- 707.8	67.99	16 20.8	59 53.6	I. N.
27	10 29.53	2.215	12 52 16.17	143.13	- 3 59 35.7	- 689.8	67.96	16 18.0	59 43.4	I. N.
28	11 22.84	2.228	13 49 39.66	143.88	- 8 23 59.7	- 624.6	68.11	16 11.9	59 20.9	I. N.
29	12 16.47	2.241	14 47 23.21	144.70	- 12 13 43.4	- 517.8	68.30	16 2.6	58 47.1	II. N.
30	13 10.32	2.243	15 45 19.32	144.82	- 15 14 6.8	- 379.9	68.36	15 51.1	58 4.8	II. N.
May 1	14 3.96	2.223	16 43 3.34	143.61	- 17 15 21.7	- 224.6	68.11	15 38.3	57 17.8	II. N.
2	14 56.81	2.176	17 39 59.32	140.30	- 18 13 21.6	- 66.0	67.48	15 25.3	56 30.1	II. N.
3	15 48.25	2.107	18 35 30.68	136.62	- 18 9 23.1	+ 83.6	66.50	15 13.3	55 45.9	II. N.
4	16 37.85	2.025	19 29 11.23	131.68	- 17 8 46.2	216.3	65.30	15 3.0	55 8.3	II. N.
5	17 25.44	1.942	20 20 51.27	126.71	- 15 19 8.2	328.4	64.05	14 55.2	54 39.6	II. N.
6	18 11.16	1.870	21 10 38.57	122.40	- 12 48 51.4	419.6	62.93	14 50.2	54 21.3	II. N.
7	18 55.37	1.818	21 58 55.15	119.23	- 9 46 7.0	+ 490.9	62.08	14 48.2	54 13.9	II. N.
8	19 38.61	1.790	22 46 12.04	117.53	- 6 18 37.5	543.5	61.59	14 49.2	54 17.4	II. N.
9	20 21.50	1.789	23 33 10.04	117.51	- 2 33 50.5	577.3	61.53	14 52.9	54 31.0	II. N.
10	21 4.73	1.818	0 20 27.68	119.25	+ 1 20 31.5	590.9	61.94	14 59.0	54 53.3	II. N.
11	21 49.00	1.876	1 8 47.67	122.70	5 15 51.3	581.4	62.78	15 6.9	55 22.7	II. N.
12	22 34.97	1.958	1 58 49.51	127.68	+ 9 2 0.1	+ 544.3	64.04	15 16.2	55 56.8	II. N.
13	23 23.16	2.060	2 51 5.67	133.79	12 26 59.9	474.9	65.58	15 26.2	56 33.3	
15	0 13.90	2.168	3 45 55.15	140.31	15 17 15.3	370.3	67.21	15 36.0	57 9.4	
16	1 7.16	2.266	4 43 15.66	146.19	17 18 42.1	231.5	68.68	15 45.2	57 43.1	I. N.
17	2 2.44	2.335	5 42 38.50	150.33	+ 18 18 53.2	+ 65.8	69.73	15 53.2	58 12.4	I. N.

## AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ' "	"	s	' "	' "	
May 17	2 2.44	2.335	5 42 38.50	150.33	+ 18 18 53.2	+ 65.8	69.73	15 53.2	58 12.4	I. N.
18	2 58.89	2.362	6 43 11.26	151.93	18 9 36.8	- 113.0	70.18	15 59.7	58 36.5	I. N.
19	3 55.46	2.346	7 43 51.10	150.98	16 49 3.1	- 287.7	70.01	16 4.7	58 54.9	I. N.
20	4 51.24	2.299	8 43 43.69	148.19	14 22 13.6	- 441.9	69.38	16 8.3	59 7.8	I. N.
21	5 45.72	2.241	9 42 18.16	144.68	10 59 51.0	- 563.9	68.55	16 10.4	59 15.4	I. N.
22	6 38.85	2.189	10 39 31.07	141.54	+ 6 56 16.3	- 647.2	67.77	16 11.0	59 17.7	I. N.
23	7 30.93	2.155	11 35 41.27	139.53	+ 2 27 39.9	- 688.8	67.24	16 10.2	59 14.7	I. N.
24	8 22.50	2.146	12 31 20.08	138.95	- 2 9 5.0	- 687.9	67.05	16 7.7	59 5.6	I. N.
25	9 14.10	2.157	13 27 0.99	139.65	- 6 37 0.5	- 644.9	67.17	16 3.5	58 50.1	I. N.
26	10 6.16	2.183	14 23 10.00	141.17	- 10 39 38.8	- 562.0	67.50	15 57.4	58 27.9	I. N.
27	10 58.87	2.209	15 19 57.70	142.73	- 14 1 57.5	- 444.4	67.85	15 49.6	57 59.2	I. N.
28	11 52.05	2.220	16 17 14.01	143.42	- 16 31 41.4	- 301.0	68.00	15 40.4	57 25.2	I. N.
29	12 45.21	2.205	17 14 28.92	142.52	- 18 0 52.9	- 144.0	67.79	15 30.2	56 47.9	II. N.
30	13 37.65	2.159	18 11 0.06	139.78	- 18 26 51.6	+ 12.9	67.15	15 19.7	56 9.6	II. N.
31	14 28.66	2.088	19 6 5.76	135.49	- 17 52 7.7	157.9	66.13	15 9.8	55 33.2	II. N.
June 1	15 17.77	2.003	19 59 17.09	130.38	- 16 23 9.3	+ 283.3	64.89	15 1.2	55 1.5	II. N.
2	16 4.82	1.919	20 50 24.67	125.32	- 14 8 33.8	385.8	63.63	14 54.4	54 36.8	II. N.
3	16 49.99	1.848	21 39 38.55	121.03	- 11 17 30.7	465.8	62.55	14 50.1	54 21.0	II. N.
4	17 33.69	1.798	22 27 24.36	118.04	- 7 58 43.1	524.9	61.78	14 48.6	54 15.4	II. N.
5	18 16.53	1.776	23 14 18.26	116.74	- 4 20 9.2	564.8	61.43	14 50.0	54 20.5	II. N.
6	18 59.22	1.786	0 1 3.00	117.31	- 0 29 20.5	+ 586.0	61.57	14 54.3	54 36.5	II. N.
7	19 42.52	1.828	0 48 24.84	119.85	+ 3 26 2.7	587.3	62.21	15 1.5	55 2.7	II. N.
8	20 27.22	1.902	1 37 10.88	124.32	7 17 22.9	565.1	63.34	15 11.0	55 37.6	II. N.
9	21 14.06	2.005	2 28 5.31	130.49	10 54 18.4	514.3	64.89	15 22.3	56 19.1	II. N.
10	22 3.61	2.127	3 21 43.34	137.83	14 4 14.8	429.3	66.69	15 34.6	57 4.2	II. N.
11	22 56.17	2.252	4 18 21.92	145.33	+ 16 32 40.7	+ 306.5	68.51	15 46.9	57 49.3	II. N.
12	23 51.53	2.357	5 17 49.38	151.63	18 4 38.9	+ 148.0	70.02	15 58.1	58 30.5	
14	0 48.94	2.419	6 19 19.94	155.37	18 27 45.7	- 35.2	70.93	16 7.4	59 4.5	
15	1 47.19	2.426	7 21 40.98	155.80	17 35 41.5	- 224.2	71.07	16 14.0	59 28.5	I. N.
16	2 44.98	2.383	8 23 34.35	153.22	15 30 33.2	- 397.1	70.50	16 17.4	59 41.2	I. N.
17	3 41.33	2.310	9 24 1.29	148.85	+ 12 22 31.6	- 516.3	69.50	16 17.9	59 43.0	I. N.
18	4 35.83	2.232	10 22 36.44	144.15	+ 8 27 17.1	- 632.3	68.41	16 15.9	59 35.5	I. N.
19	5 28.58	2.168	11 19 26.77	140.27	+ 4 2 45.1	- 682.9	67.48	16 11.7	59 20.4	I. N.
20	6 20.07	2.128	12 15 1.19	137.88	- 0 33 10.9	- 689.8	66.88	16 6.2	58 59.9	I. N.
21	7 10.93	2.115	13 9 57.94	137.12	- 5 3 47.1	- 656.7	66.66	15 59.5	58 35.7	I. N.
22	8 1.78	2.125	14 4 53.75	137.74	- 9 13 44.2	- 587.2	66.77	15 52.3	58 9.0	I. N.
23	8 53.05	2.149	15 0 15.06	139.14	- 12 49 14.3	- 485.3	67.07	15 44.5	57 40.3	I. N.
24	9 44.90	2.171	15 56 10.93	140.47	- 15 38 26.3	- 356.8	67.35	15 36.3	57 10.2	I. N.
25	10 37.13	2.178	16 52 29.82	140.90	- 17 32 17.0	- 210.2	67.41	15 27.8	56 39.3	I. N.
26	11 29.24	2.160	17 48 41.62	139.80	- 18 25 34.6	- 56.1	67.10	15 19.3	56 7.9	I. N.
27	12 20.56	2.113	18 44 6.12	136.96	- 18 17 43.9	+ 93.7	66.39	15 10.9	55 37.3	II. N.
28	13 10.47	2.043	19 38 5.45	132.79	- 17 12 35.3	229.0	65.36	15 3.2	55 9.0	II. N.
29	13 58.56	1.963	20 30 15.00	127.96	- 15 17 20.5	343.5	64.16	14 56.5	54 44.4	II. N.
30	14 44.72	1.885	21 20 28.72	123.27	- 12 40 59.4	434.4	62.99	14 51.3	54 25.3	II. N.
July 1	15 29.15	1.821	22 8 58.67	119.41	- 9 32 55.9	+ 502.2	62.03	14 48.1	54 13.6	II. N.

## AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limb.
July	h m	m	h m s	s	° ' "	"	s	' "	' "	
1	15 29.15	1.821	22 8 58.67	119.41	- 9 32 55.9	+ 502.2	62.03	14 48.1	54 13.6	II. N.
2	16 12.31	1.779	22 56 11.42	116.91	- 6 2 3.6	548.7	61.41	14 47.3	54 10.5	II. N.
3	16 54.78	1.766	23 42 43.62	116.08	- 2 16 34.0	575.6	61.23	14 49.1	54 17.2	II. N.
4	17 37.31	1.783	0 29 18.54	117.16	+ 1 35 52.2	583.4	61.55	14 53.8	54 34.3	II. N.
5	18 20.66	1.835	1 16 43.33	120.25	5 27 26.7	570.9	62.37	15 1.3	55 2.1	II. N.
6	19 5.64	1.920	2 5 46.37	125.35	+ 9 9 27.4	+ 534.9	63.70	15 11.6	55 39.8	II. N.
7	19 53.02	2.033	2 57 13.37	132.19	12 31 30.5	470.1	65.43	15 24.2	56 25.9	II. N.
8	20 43.39	2.166	3 51 40.23	140.18	15 20 57.7	370.9	67.39	15 38.3	57 17.8	II. N.
9	21 37.00	2.300	4 49 22.59	148.24	17 23 14.9	234.0	69.32	15 53.0	58 11.6	II. N.
10	22 33.60	2.410	5 50 4.30	154.84	18 23 33.9	+ 62.4	70.85	16 6.9	59 2.6	II. N.
11	23 32.29	2.471	6 52 51.70	158.51	+ 18 10 17.3	- 130.9	71.69	16 18.6	59 45.8	
13	0 31.72	2.472	7 56 23.91	158.56	16 38 58.9	- 323.6	71.70	16 27.0	60 16.2	
14	1 30.51	2.421	8 59 17.60	155.49	13 54 52.9	- 490.9	71.00	16 30.9	60 30.7	I. N.
15	2 27.68	2.341	10 0 33.71	150.69	10 12 7.1	- 614.5	69.90	16 30.4	60 29.0	I. N.
16	3 22.85	2.258	10 59 49.66	145.70	5 50 13.3	- 686.0	68.74	16 25.9	60 12.4	I. N.
17	4 16.19	2.191	11 57 15.39	141.65	+ 1 10 9.0	- 706.1	67.80	16 18.2	59 44.2	I. N.
18	5 8.20	2.147	12 53 20.71	139.06	- 3 28 33.6	- 680.4	67.18	16 8.5	59 8.5	I. N.
19	5 59.47	2.129	13 48 41.90	137.95	- 7 49 1.5	- 616.0	66.91	15 57.7	58 28.9	I. N.
20	6 50.54	2.130	14 43 51.20	137.99	- 11 37 12.3	- 520.0	66.91	15 46.8	57 48.9	I. N.
21	7 41.75	2.139	15 39 8.88	138.53	- 14 41 46.5	- 399.1	67.01	15 36.2	57 10.0	I. N.
22	8 33.16	2.144	16 34 38.61	138.85	- 16 54 9.1	- 260.4	67.03	15 26.3	56 33.7	I. N.
23	9 24.55	2.135	17 30 6.65	138.28	- 18 8 52.2	- 112.3	66.82	15 17.3	56 0.7	I. N.
24	10 15.45	2.104	18 25 5.96	136.42	- 18 24 1.9	+ 35.7	66.30	15 9.2	55 31.1	I. N.
25	11 5.35	2.051	19 19 4.57	133.27	- 17 41 31.1	174.5	65.46	15 2.1	55 4.8	I. N.
26	11 53.79	1.984	20 11 35.62	129.22	- 16 6 35.6	296.8	64.41	14 56.0	54 42.4	I. N.
27	12 40.54	1.912	21 2 24.66	124.89	- 13 46 56.7	+ 397.7	63.28	14 51.0	54 24.2	II. N.
28	13 25.61	1.846	21 51 32.62	120.91	- 10 51 32.7	475.5	62.26	14 47.4	54 11.0	II. N.
29	14 9.25	1.794	22 39 14.90	117.82	- 7 29 37.1	530.4	61.49	14 45.5	54 3.9	II. N.
30	14 51.91	1.765	23 25 58.27	116.05	- 3 50 2.7	563.9	61.07	14 45.4	54 3.7	II. N.
31	15 34.18	1.760	0 12 17.72	115.87	- 0 1 9.8	577.1	61.08	14 47.7	54 11.9	II. N.
Aug.										
1	16 16.72	1.788	0 58 53.90	117.46	+ 3 49 1.2	+ 570.4	61.57	14 52.4	54 29.2	II. N.
2	17 0.28	1.846	1 46 30.86	120.94	7 32 21.0	542.6	62.54	14 59.8	54 56.3	II. N.
3	17 45.59	1.934	2 35 53.43	126.25	10 59 53.3	490.8	63.96	15 9.9	55 33.3	II. N.
4	18 33.34	2.049	3 27 43.27	133.13	14 1 14.5	410.9	65.73	15 22.5	56 19.6	II. N.
5	19 24.07	2.180	4 22 31.82	141.00	16 24 13.1	298.3	67.67	15 37.1	57 13.4	II. N.
6	20 17.96	2.309	5 20 30.60	148.78	+ 17 55 13.8	+ 151.1	69.53	15 53.0	58 11.7	II. N.
7	21 14.71	2.413	6 21 21.14	155.07	18 21 2.0	- 26.3	70.98	16 8.9	59 9.9	II. N.
8	22 13.44	2.472	7 24 11.68	158.59	17 31 58.2	- 220.1	71.76	16 23.1	60 2.1	II. N.
9	23 12.94	2.477	8 27 47.83	158.86	15 25 44.2	- 408.0	71.78	16 34.1	60 42.3	
11	0 11.96	2.436	9 30 55.31	156.39	12 9 40.8	- 565.3	71.18	16 40.3	61 5.5	
12	1 9.65	2.369	10 32 42.34	152.40	+ 8 0 6.3	- 673.2	70.25	16 41.2	61 8.6	I. N.
13	2 5.66	2.300	11 32 49.15	148.22	+ 3 18 51.9	- 723.2	69.29	16 36.6	60 51.6	I. N.
14	3 0.14	2.242	12 31 23.09	141.77	- 1 30 53.4	- 716.8	68.50	16 27.4	60 18.1	I. N.
15	3 53.44	2.203	13 28 46.82	142.40	- 6 8 0.0	- 661.6	67.97	16 15.2	59 33.1	I. N.
16	4 46.01	2.180	14 25 26.24	141.03	- 10 15 5.0	- 568.3	67.68	16 1.3	58 42.2	I. N.



## AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limb.
	h m	m	h m s	s	° ' "	"	s	"	"	
Aug. 16	4 46.01	2.180	14 25 26.24	141.03	- 10 15 5.0	- 568.3	67.68	16 1.3	58 42.2	I. N.
17	5 38.18	2.168	15 21 41.07	140.27	- 13 38 58.5	- 447.4	67.51	15 47.2	57 50.2	I. N.
18	6 30.06	2.156	16 17 39.23	139.55	- 16 10 34.9	- 308.4	67.32	15 33.6	57 0.7	I. N.
19	7 21.58	2.135	17 13 15.15	138.33	- 17 44 35.3	- 160.7	66.98	15 21.6	56 16.2	I. N.
20	8 12.44	2.101	18 8 12.08	136.26	- 18 19 14.5	- 13.0	66.41	15 11.1	55 38.0	I. N.
21	9 2.30	2.051	19 2 8.07	133.26	- 17 56 4.4	+ 127.0	65.58	15 2.5	55 6.4	I. S.
22	9 50.81	1.990	19 54 43.07	129.57	- 16 39 29.5	253.1	64.57	14 55.7	54 41.3	I. S.
23	10 37.77	1.924	20 45 45.11	125.60	- 14 36 6.1	360.6	63.49	14 50.5	54 22.2	I. S.
24	11 23.17	1.861	21 35 13.33	121.85	- 11 53 56.4	446.7	62.46	14 46.8	54 8.8	I. S.
25	12 7.19	1.810	22 23 18.40	118.72	- 8 41 43.6	510.7	61.63	14 44.6	54 0.7	II. N.
26	12 50.17	1.775	23 10 20.77	116.65	- 5 8 21.1	+ 552.6	61.09	14 44.0	53 58.3	II. N.
27	13 32.57	1.762	23 56 48.25	115.87	- 1 22 32.7	572.9	60.91	14 44.9	54 1.7	II. N.
28	14 14.94	1.773	0 43 13.97	116.55	+ 2 27 8.0	572.0	61.15	14 47.6	54 11.7	II. N.
29	14 57.89	1.810	1 30 14.41	118.76	6 12 11.2	549.6	61.81	14 52.3	54 28.9	II. N.
30	15 42.04	1.874	2 18 27.51	122.59	9 43 49.2	504.6	62.89	14 59.2	54 54.2	II. N.
31	16 28.02	1.961	3 8 30.08	127.86	+ 12 52 36.3	+ 434.9	64.33	15 8.4	55 27.9	II. N.
Sept. 1	17 16.34	2.067	4 0 53.71	134.26	15 28 6.9	337.8	66.00	15 19.9	56 10.0	II. N.
2	18 7.34	2.182	4 55 58.58	141.17	17 18 56.8	211.4	67.74	15 33.5	57 0.1	II. N.
3	19 1.04	2.291	5 53 46.40	147.67	18 13 24.7	+ 56.4	69.32	15 48.8	57 56.2	II. N.
4	19 57.09	2.375	6 53 54.90	152.72	18 1 12.2	- 120.4	70.49	16 4.7	58 54.6	II. S.
5	20 54.73	2.422	7 55 39.22	155.56	+ 16 36 1.3	- 305.4	71.11	16 19.9	59 50.3	II. S.
6	21 53.02	2.430	8 58 2.70	156.01	13 58 20.6	- 479.1	71.16	16 32.8	60 37.6	II. S.
7	22 51.09	2.406	10 0 13.31	154.63	10 17 3.9	- 620.1	70.78	16 41.6	61 10.1	II. S.
8	23 48.39	2.368	11 1 37.31	152.31	5 49 1.8	- 710.6	70.20	16 45.1	61 22.9	
10	0 44.73	2.328	12 2 3.23	149.91	+ 0 56 29.9	- 741.6	69.64	16 42.7	61 14.0	
11	1 40.19	2.295	13 1 36.40	147.95	- 3 56 29.6	- 713.7	69.21	16 34.7	60 44.8	I. N.
12	2 34.97	2.271	14 0 29.06	146.50	- 8 27 37.5	- 634.4	68.91	16 22.4	59 59.6	I. N.
13	3 29.24	2.251	14 58 50.68	145.30	- 12 18 45.6	- 516.1	68.67	16 7.4	59 4.6	I. N.
14	4 23.00	2.228	15 56 41.66	143.88	- 15 17 8.6	- 372.9	68.38	15 51.4	58 5.9	I. N.
15	5 16.08	2.193	16 53 51.49	141.81	- 17 15 32.8	- 218.2	67.90	15 35.8	57 8.8	I. N.
16	6 8.16	2.144	17 50 1.47	138.88	- 18 11 43.1	- 63.4	67.18	15 21.8	56 17.0	I. N.
17	6 58.90	2.082	18 44 50.85	135.12	- 18 7 29.2	+ 82.6	66.21	15 9.7	55 32.8	I. S.
18	7 48.03	2.011	19 38 3.21	130.85	- 17 7 39.9	213.7	65.07	15 0.1	54 57.4	I. S.
19	8 35.43	1.939	20 29 31.39	126.52	- 15 18 59.9	326.4	63.88	14 52.8	54 30.9	I. S.
20	9 21.15	1.873	21 19 19.16	122.56	- 12 49 16.3	418.8	62.78	14 48.0	54 13.0	I. S.
21	10 5.44	1.820	22 7 40.28	119.35	- 9 46 44.4	+ 490.4	61.86	14 45.1	54 2.6	I. S.
22	10 48.65	1.784	22 54 56.51	117.19	- 6 19 49.0	540.8	61.24	14 44.2	53 58.9	I. S.
23	11 31.24	1.762	23 41 35.10	116.25	- 2 36 58.8	569.9	60.96	14 44.8	54 1.4	I. S.
24	12 13.71	1.775	0 28 6.85	116.64	+ 1 13 9.7	577.2	61.06	14 46.9	54 9.2	II. N. S.
25	12 56.60	1.804	1 15 4.31	118.39	5 1 46.2	562.0	61.56	14 50.5	54 22.2	II. N.
26	13 40.47	1.855	2 3 0.08	121.48	+ 8 39 37.8	+ 523.2	62.43	14 55.5	54 40.7	II. N.
27	14 25.81	1.926	2 52 24.62	125.75	11 57 2.0	459.5	63.61	15 2.0	55 4.6	II. N.
28	15 13.05	2.012	3 43 43.23	130.91	14 43 45.6	369.7	65.02	15 10.1	55 34.4	II. N.
29	16 2.45	2.105	4 37 11.98	136.50	16 49 15.6	253.4	66.50	15 20.0	56 10.5	II. N.
30	16 54.06	2.194	5 32 53.42	141.85	+ 18 3 11.7	+ 112.4	67.89	15 31.5	56 52.8	II. N.

## AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limb.
	h m	m	h m s	s	° ' "	"	s	"	"	
Sept. 30	16 54.06	2.194	5 32 53.42	141.85	+ 18 3 11.7	+ 112.4	67.89	15 31.5	56 52.8	II. N.
Oct. 1	17 47.64	2.268	6 30 33.61	146.27	18 16 29.4	- 48.6	69.00	15 44.4	57 40.1	II. S.
2	18 42.71	2.317	7 29 43.30	149.25	17 22 52.1	- 220.3	69.71	15 58.2	58 30.6	II. S.
3	19 38.64	2.340	8 29 44.93	150.62	15 20 31.6	- 389.7	70.00	16 12.0	59 21.2	II. S.
4	20 34.84	2.341	9 30 2.94	150.70	12 13 31.2	- 540.9	69.96	16 24.4	60 7.1	II. S.
5	21 30.92	2.331	10 30 13.37	150.10	+ 8 12 21.8	- 657.9	69.76	16 34.2	60 42.8	II. S.
6	22 26.74	2.321	11 30 7.86	149.46	+ 3 33 35.3	- 727.1	69.56	16 39.8	61 3.2	II. S.
7	23 22.36	2.316	12 29 50.96	149.19	- 1 21 44.3	- 739.7	69.46	16 40.1	61 4.6	
9	0 17.96	2.318	13 29 32.62	149.31	- 6 10 25.9	- 694.3	69.49	16 35.0	60 45.9	
10	1 13.63	2.321	14 29 18.64	149.47	- 10 30 11.7	- 596.7	69.57	16 25.1	60 9.2	I. N.
11	2 9.27	2.314	15 29 3.01	149.06	- 14 2 30.2	- 459.4	69.52	16 11.4	59 19.2	I. N.
12	3 4.54	2.288	16 28 24.65	147.49	- 16 34 42.3	- 299.0	69.20	15 55.7	58 21.8	I. N.
13	3 58.89	2.237	17 26 51.06	144.44	- 18 0 53.9	- 134.1	68.52	15 39.7	57 23.0	I. N.
14	4 51.74	2.164	18 23 47.32	140.04	- 18 21 23.0	+ 27.5	67.48	15 24.7	56 27.8	I. S.
15	5 42.64	2.076	19 18 46.31	134.79	- 17 41 6.8	170.5	66.18	15 11.6	55 39.7	I. S.
16	6 31.39	1.986	20 11 35.60	129.36	- 16 7 46.7	+ 292.5	64.77	15 0.9	55 0.8	I. S.
17	7 18.04	1.904	21 2 18.88	124.39	- 13 50 8.5	392.1	63.43	14 53.1	54 32.1	I. S.
18	8 2.89	1.838	21 51 13.61	120.37	- 10 57 0.8	470.1	62.32	14 48.1	54 13.7	I. S.
19	8 46.38	1.791	22 38 46.86	117.62	- 7 36 48.8	527.6	61.53	14 45.8	54 5.1	I. S.
20	9 29.06	1.770	23 25 31.32	116.32	- 3 57 39.6	565.0	61.11	14 45.8	54 5.1	I. S.
21	10 11.52	1.773	0 12 2.44	116.53	- 0 7 38.4	+ 581.7	61.10	14 47.8	54 12.5	I. S.
22	10 54.36	1.801	0 58 56.23	118.20	+ 3 44 46.7	576.5	61.52	14 51.5	54 25.9	I. S.
23	11 38.14	1.852	1 46 47.15	121.26	7 30 25.4	547.4	62.31	14 56.5	54 44.4	I. S.
24	12 23.39	1.922	2 36 5.90	125.48	10 59 14.3	492.1	63.43	15 2.6	55 6.7	II. S.
25	13 10.49	2.005	3 27 15.99	130.46	14 0 20.3	408.7	64.76	15 9.6	55 32.2	II. N. S.
26	13 59.63	2.091	4 20 29.50	135.65	+ 16 22 27.4	+ 297.2	66.13	15 17.2	56 0.4	II. N. S.
27	14 50.78	2.169	5 15 43.30	140.37	17 54 48.7	160.5	67.38	15 25.7	56 31.4	II. S.
28	15 43.60	2.228	6 12 37.53	143.92	18 28 21.8	+ 4.6	68.33	15 34.8	57 4.9	II. S.
29	16 37.53	2.261	7 10 38.91	145.91	17 57 15.2	- 160.9	68.87	15 44.5	57 40.7	II. S.
30	17 31.95	2.269	8 9 9.41	146.38	16 19 56.3	- 324.3	69.02	15 54.7	58 18.0	II. S.
31	18 26.32	2.260	9 7 37.32	145.81	+ 13 39 46.2	- 473.3	68.88	16 4.9	58 55.3	II. S.
Nov. 1	19 20.37	2.245	10 5 45.93	144.93	10 4 53.4	- 596.1	68.63	16 14.4	59 30.0	II. S.
2	20 14.12	2.236	11 3 36.33	144.41	5 47 47.5	- 682.7	68.45	16 22.1	59 58.7	II. S.
3	21 7.83	2.242	12 1 24.15	144.76	+ 1 4 42.4	- 724.7	68.48	16 27.3	60 17.6	II. S.
4	22 1.88	2.264	12 59 32.22	146.07	- 3 45 10.5	- 715.9	68.75	16 28.9	60 23.2	II. S.
5	22 56.59	2.296	13 58 20.37	148.01	- 8 20 56.9	- 654.3	69.18	16 26.2	60 13.4	
6	23 52.08	2.327	14 57 55.56	149.83	- 12 22 1.3	- 543.7	69.61	16 19.2	59 48.0	
8	0 48.12	2.339	15 58 3.76	150.58	- 15 30 44.0	- 394.9	69.82	16 8.6	59 9.0	I. S.
9	1 44.10	2.320	16 58 8.54	149.44	- 17 35 0.2	- 224.5	69.59	15 55.4	58 20.5	I. S.
10	2 39.18	2.264	17 57 19.07	146.07	- 18 29 54.6	- 51.0	68.83	15 41.0	57 27.7	I. S.
11	3 32.53	2.177	18 54 45.11	140.85	- 18 17 31.2	+ 109.9	67.61	15 26.7	56 35.4	I. S.
12	4 23.56	2.074	19 49 51.90	134.64	- 17 5 3.5	248.3	66.11	15 13.7	55 47.7	I. S.
13	5 12.08	1.970	20 42 27.57	128.41	- 15 2 22.6	360.7	64.55	15 2.9	55 8.0	I. S.
14	5 58.25	1.881	21 32 42.24	123.01	- 12 19 48.8	447.9	63.15	14 54.9	54 38.3	I. S.
15	6 42.53	1.813	22 21 2.40	118.94	- 9 7 2.4	+ 512.4	62.06	14 49.7	54 19.3	I. S.

## AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ' "	"	s	' "	' "	
Nov. 15	6 42.53	1.813	22 21 2.40	118.94	- 9 7 2.4	+ 512.4	62.06	14 49.7	54 19.3	I. S.
16	7 25.50	1.773	23 8 4.59	116.54	- 5 32 40.4	556.2	61.37	14 47.5	54 11.2	I. S.
17	8 7.87	1.763	23 54 30.34	115.93	- 1 44 37.5	580.7	61.14	14 48.1	54 13.6	I. S.
18	8 50.36	1.782	0 41 2.86	117.11	+ 2 9 20.5	585.6	61.40	14 51.3	54 25.4	I. S.
19	9 33.66	1.831	1 28 24.65	120.00	6 0 56.8	568.5	62.12	14 56.7	54 45.1	I. S.
20	10 18.43	1.904	2 17 14.74	124.41	+ 9 40 48.1	+ 526.2	63.23	15 3.7	55 10.6	I. S.
21	11 5.19	1.996	3 8 4.95	129.93	12 58 5.6	455.2	64.62	15 11.7	55 40.2	I. S.
22	11 54.28	2.095	4 1 14.42	135.89	15 40 45.4	353.0	66.13	15 20.3	56 11.7	II. S.
23	12 45.68	2.186	4 56 43.53	141.39	17 36 23.0	220.5	67.52	15 28.9	56 43.4	II. S.
24	13 39.03	2.254	5 54 9.74	145.48	18 33 53.2	+ 63.7	68.57	15 37.3	57 14.0	II. S.
25	14 33.60	2.287	6 52 49.89	147.48	+ 18 25 36.8	- 106.2	69.12	15 45.0	57 42.4	II. S.
26	15 28.53	2.284	7 51 50.96	147.28	17 9 10.8	- 274.6	69.14	15 52.1	58 8.3	II. S.
27	16 23.02	2.254	8 50 26.01	145.46	14 48 3.2	- 427.4	68.76	15 58.4	58 31.6	II. S.
28	17 16.62	2.213	9 48 7.55	143.00	11 30 52.4	- 553.3	68.19	16 4.0	58 51.9	II. S.
29	18 9.29	2.178	10 44 52.63	140.90	7 30 1.2	- 644.8	67.68	16 8.6	59 8.9	II. S.
30	19 1.32	2.162	11 40 59.84	139.91	+ 3 0 15.6	- 697.1	67.42	16 12.1	59 21.8	II. S.
Dec. 1	19 53.25	2.170	12 37 0.85	140.41	- 1 42 3.4	- 707.1	67.50	16 14.0	59 28.8	II. S.
2	20 45.67	2.201	13 33 30.81	142.29	- 6 19 26.6	- 672.2	67.91	16 13.9	59 28.3	II. S.
3	21 39.03	2.247	14 30 57.72	145.03	- 10 33 48.5	- 592.1	68.52	16 11.2	59 18.6	II. S.
4	22 33.51	2.291	15 29 31.97	147.72	- 14 7 35.0	- 470.3	69.13	16 5.9	58 59.0	II. S.
5	23 28.86	2.316	16 28 58.62	149.21	- 16 45 41.8	- 315.9	69.46	15 57.9	58 29.8	
7	0 24.39	2.305	17 28 36.31	148.52	- 18 17 57.7	- 143.9	69.30	15 47.8	57 52.7	
8	1 19.15	2.252	18 27 27.29	145.31	- 18 40 51.7	+ 28.0	68.55	15 36.3	57 10.5	I. S.
9	2 12.19	2.164	19 24 34.83	140.03	- 17 57 41.5	184.2	67.31	15 24.4	56 26.7	I. S.
10	3 2.86	2.058	20 19 20.21	133.66	- 16 16 53.4	315.1	65.76	15 13.0	55 45.0	I. S.
11	3 50.96	1.952	21 11 30.86	127.31	- 13 49 25.6	+ 417.5	64.19	15 3.1	55 8.8	I. S.
12	4 36.69	1.862	22 1 18.60	121.88	- 10 46 33.2	492.7	62.83	14 55.5	54 40.6	I. S.
13	5 20.54	1.796	22 49 13.07	117.95	- 7 18 30.0	544.0	61.81	14 50.4	54 22.1	I. S.
14	6 3.17	1.762	23 35 54.55	115.84	- 3 34 8.8	574.6	61.24	14 48.3	54 14.5	I. S.
15	6 45.35	1.759	0 22 8.89	115.69	+ 0 18 37.6	586.2	61.19	14 49.3	54 18.1	I. S.
16	7 27.88	1.790	1 8 44.03	117.56	+ 4 12 14.6	+ 578.5	61.67	14 53.3	54 32.6	I. S.
17	8 11.54	1.853	1 56 27.33	121.36	7 58 36.7	549.4	62.63	15 0.0	54 56.9	I. S.
18	8 57.06	1.944	2 46 2.58	126.83	11 28 21.9	494.7	64.00	15 8.8	55 29.5	I. S.
19	9 45.02	2.055	3 38 4.69	133.49	14 30 21.7	409.9	65.65	15 19.2	56 7.8	I. S.
20	10 35.73	2.171	4 32 52.29	140.46	16 51 50.4	291.9	67.35	15 30.5	56 48.9	I. S.
21	11 29.09	2.272	5 30 19.09	146.53	+ 18 19 35.8	+ 142.1	68.82	15 41.6	57 29.6	I. S.
22	12 24.49	2.338	6 29 49.00	150.51	18 42 20.2	- 31.1	69.78	15 51.6	58 6.6	II. S.
23	13 20.93	2.357	7 30 21.27	151.67	17 53 39.6	- 212.0	70.08	16 0.0	58 37.2	II. S.
24	14 17.27	2.332	8 30 47.64	150.13	15 54 15.0	- 381.6	69.76	16 6.1	58 59.8	II. S.
25	15 12.61	2.277	9 30 13.70	146.86	12 52 8.9	- 523.1	69.03	16 9.9	59 13.8	II. S.
26	16 6.52	2.215	10 28 13.46	143.15	+ 9 0 54.0	- 626.1	68.19	16 11.5	59 19.6	II. S.
27	16 59.06	2.166	11 24 50.95	140.16	+ 4 36 59.0	- 686.2	67.49	16 11.2	59 18.4	II. S.
28	17 50.67	2.140	12 20 32.59	138.58	- 0 2 17.8	- 703.0	67.11	16 9.3	59 11.7	II. S.
29	18 41.98	2.141	13 15 56.12	138.65	- 4 39 55.3	- 678.2	67.12	16 6.3	59 0.4	II. S.
30	19 33.62	2.166	14 11 39.71	140.17	- 8 59 33.2	- 613.5	67.47	16 2.1	58 45.0	II. S.
31	20 26.07	2.206	15 8 11.67	142.57	- 12 45 45.7	- 511.7	68.00	15 56.9	58 26.0	II. S.

## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Jan. 0	1 27.0	20 3 5.03	-21 42 43.9	8.7	3.3	0.24	Feb. 14	22 33.1	20 9 58.38	-20 23 22.1	8.3	3.2	0.23
1	1 27.2	20 7 14.63	21 19 27.7	8.9	3.4	0.24	15	22 34.4	20 15 11.02	20 15 54.7	8.1	3.1	0.22
2	1 27.0	20 10 57.40	20 56 1.9	9.2	3.5	0.25	16	22 35.8	20 20 29.97	20 7 12.6	8.0	3.1	0.22
3	1 26.3	20 14 10.13	20 32 42.3	9.5	3.6	0.26	17	22 37.2	20 25 54.72	19 57 15.3	7.9	3.0	0.21
4	1 25.0	20 16 49.42	20 9 47.3	9.8	3.7	0.26	18	22 38.7	20 31 24.78	19 46 2.0	7.8	3.0	0.21
5	1 23.1	20 18 51.83	-19 47 35.6	10.1	3.8	0.27	19	22 40.4	20 36 59.70	-19 33 32.3	7.7	3.0	0.21
6	1 20.5	20 20 14.08	19 26 27.6	10.4	3.9	0.27	20	22 42.1	20 42 39.10	19 19 45.9	7.6	2.9	0.21
7	1 17.2	20 20 53.10	19 6 43.2	10.7	4.0	0.28	21	22 43.9	20 48 22.60	19 4 42.6	7.6	2.9	0.21
8	1 13.2	20 20 46.38	18 48 42.6	11.0	4.1	0.29	22	22 45.7	20 54 9.91	18 48 22.0	7.5	2.8	0.20
9	1 8.4	20 19 52.13	18 32 43.5	11.3	4.2	0.30	23	22 47.6	21 0 0.73	18 30 43.9	7.4	2.8	0.20
10	1 2.7	20 18 9.63	-18 19 1.4	11.7	4.4	0.31	24	22 49.5	21 5 54.85	-18 11 48.3	7.3	2.8	0.20
11	0 56.3	20 15 39.60	18 7 48.5	12.0	4.5	0.32	25	22 51.5	21 11 52.03	17 51 34.9	7.2	2.8	0.20
12	0 49.2	20 12 24.29	17 59 13.0	12.2	4.6	0.33	26	22 53.5	21 17 52.06	17 30 3.5	7.2	2.7	0.20
13	0 41.3	20 8 27.79	17 53 16.3	12.5	4.7	0.33	27	22 55.6	21 23 54.77	17 7 14.3	7.1	2.7	0.19
14	0 32.8	20 3 55.95	17 49 55.4	12.8	4.8	0.34	28	22 57.8	21 30 0.05	16 43 7.1	7.1	2.7	0.19
15	0 23.9	19 58 56.28	-17 49 2.7	13.0	4.9	0.34	29	23 0.0	21 36 7.77	-16 17 42.0	7.0	2.7	0.19
16	0 14.7	19 53 37.65	17 50 25.9	13.1	4.9	0.35	Mar. 1	23 2.2	21 42 17.80	15 50 59.1	7.0	2.7	0.19
17	0 5.3	19 48 9.69	17 53 49.8	13.1	4.9	0.35	2	23 4.5	21 48 30.06	15 22 58.4	6.9	2.6	0.19
17	23 56.0	19 42 42.14	17 58 57.9	13.2	5.0	0.35	3	23 6.8	21 54 44.50	14 53 40.2	6.9	2.6	0.18
18	23 46.8	19 37 24.42	18 5 33.5	13.2	5.0	0.35	4	23 9.1	22 1 1.07	14 23 4.2	6.9	2.6	0.18
19	23 37.9	19 32 24.93	-18 13 20.1	13.1	5.0	0.35	5	23 11.5	22 7 19.76	-13 51 10.9	6.9	2.6	0.18
20	23 29.4	19 27 50.77	18 22 2.8	13.0	5.0	0.34	6	23 13.9	22 13 40.53	13 18 0.3	6.8	2.6	0.18
21	23 21.4	19 23 47.40	18 31 28.1	12.8	4.9	0.34	7	23 16.3	22 20 3.38	12 43 32.9	6.8	2.5	0.17
22	23 14.0	19 20 18.64	18 41 23.4	12.6	4.8	0.34	8	23 18.8	22 26 28.35	12 7 48.7	6.7	2.5	0.17
23	23 7.2	19 17 26.91	18 51 38.6	12.4	4.7	0.33	9	23 21.3	22 32 55.44	11 30 48.1	6.7	2.5	0.17
24	23 1.1	19 15 13.20	-19 2 3.3	12.2	4.6	0.33	10	23 23.9	22 39 24.73	-10 52 31.6	6.7	2.5	0.17
25	22 55.5	19 13 37.44	19 12 28.9	12.0	4.6	0.33	11	23 26.5	22 45 56.26	10 12 59.5	6.6	2.5	0.17
26	22 50.6	19 12 38.78	19 22 47.5	11.8	4.5	0.32	12	23 29.1	22 52 30.07	9 32 12.1	6.6	2.5	0.17
27	22 46.3	19 12 15.74	19 32 52.1	11.6	4.4	0.32	13	23 31.7	22 59 6.24	8 50 10.5	6.5	2.5	0.17
28	22 42.6	19 12 26.42	19 42 35.8	11.3	4.3	0.30	14	23 34.3	23 5 44.89	8 6 55.1	6.5	2.5	0.17
29	22 39.3	19 13 8.75	-19 51 52.4	11.0	4.2	0.30	15	23 37.0	23 12 26.08	-7 22 27.0	6.5	2.5	0.17
30	22 36.6	19 14 20.49	20 0 36.3	10.8	4.2	0.30	16	23 39.8	23 19 9.93	6 36 47.1	6.5	2.5	0.17
31	22 34.3	19 15 59.42	20 8 42.2	10.6	4.1	0.29	17	23 42.7	23 25 56.49	5 49 56.8	6.5	2.5	0.16
Feb. 1	22 32.4	19 18 3.38	20 16 5.6	10.4	4.0	0.29	18	23 45.6	23 32 45.90	5 1 57.5	6.5	2.5	0.16
2	22 30.9	19 20 30.27	20 22 42.2	10.2	3.9	0.28	19	23 48.5	23 39 38.27	4 12 50.8	6.5	2.5	0.16
3	22 29.8	19 23 18.16	-20 28 27.9	9.9	3.8	0.27	20	23 51.5	23 46 33.64	-3 22 39.1	6.5	2.5	0.16
4	22 29.0	19 26 25.16	20 33 19.7	9.7	3.8	0.27	21	23 54.5	23 53 32.09	2 31 24.4	6.5	2.5	0.16
5	22 28.4	19 29 49.61	20 37 14.1	9.5	3.7	0.26	22	23 57.6	0 0 33.68	1 39 10.2	6.5	2.5	0.16
6	22 28.2	19 33 29.97	20 40 8.6	9.3	3.6	0.26	24	0 0.7	0 7 38.40	-0 46 0.0	6.5	2.5	0.16
7	22 28.1	19 37 24.81	20 42 0.4	9.2	3.5	0.25	25	0 3.9	0 14 46.27	+0 8 2.2	6.5	2.5	0.16
8	22 28.3	19 41 32.81	-20 42 47.7	9.0	3.4	0.24	26	0 7.1	0 21 57.27	+1 2 51.6	6.5	2.5	0.16
9	22 28.6	19 45 52.76	20 42 28.5	8.8	3.4	0.24	27	0 10.4	0 29 11.20	1 58 22.8	6.6	2.5	0.16
10	22 29.1	19 50 23.63	20 41 1.1	8.7	3.3	0.24	28	0 13.7	0 36 27.95	2 54 29.0	6.6	2.5	0.17
11	22 29.8	19 55 4.47	20 38 23.9	8.6	3.3	0.24	29	0 17.1	0 43 47.21	3 51 2.8	6.7	2.5	0.17
12	22 30.7	19 59 54.41	20 34 35.8	8.5	3.2	0.23	30	0 20.5	0 51 8.68	4 47 55.9	6.7	2.5	0.17
13	22 31.9	20 4 52.63	-20 29 35.5	8.4	3.2	0.23	31	0 23.9	0 58 31.90	+5 44 59.1	6.7	2.5	0.17
14	22 33.1	20 9 58.38	-20 23 22.1	8.3	3.2	0.23	Apr. 1	0 27.4	1 5 56.34	+6 42 1.8	6.8	2.6	0.17

## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid.T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Apr. 1	0 27.4	1 5 56.34	+ 6 42 1.8	6.8	2.6	0.17	May 16	23 31.7	3 11 27.81	+16 3 32.0	15.8	6.0	0.42
2	0 30.9	1 13 21.35	7 38 53.3	6.9	2.7	0.18	17	23 26.0	3 9 44.90	15 40 26.6	15.7	5.9	0.41
3	0 34.3	1 20 46.09	8 35 20.6	6.9	2.7	0.18	18	23 20.6	3 8 12.01	15 18 45.8	15.6	5.9	0.41
4	0 37.7	1 28 9.70	9 31 11.3	7.0	2.7	0.18	19	23 15.3	3 6 50.70	14 58 42.8	15.4	5.8	0.40
5	0 41.0	1 35 31.17	10 26 11.7	7.1	2.7	0.18	20	23 10.2	3 5 42.19	14 40 28.8	15.3	5.8	0.39
6	0 44.3	1 42 49.35	+11 20 8.7	7.2	2.8	0.19	21	23 5.4	3 4 47.52	+14 24 13.9	15.1	5.7	0.39
7	0 47.6	1 50 3.05	12 12 48.0	7.3	2.8	0.19	22	23 0.8	3 4 7.52	14 10 5.3	14.9	5.6	0.38
8	0 50.8	1 57 11.05	13 3 56.7	7.4	2.9	0.20	23	22 56.5	3 3 42.84	13 58 8.7	14.7	5.6	0.38
9	0 54.0	2 4 12.05	13 53 22.8	7.6	2.9	0.20	24	22 52.4	3 3 33.96	13 48 27.9	14.5	5.5	0.38
10	0 57.0	2 11 4.71	14 40 54.4	7.7	2.9	0.20	25	22 48.5	3 3 41.18	13 41 5.0	14.3	5.4	0.37
11	0 59.8	2 17 47.83	+15 26 21.1	7.8	3.0	0.21	26	22 45.0	3 4 4.72	+13 36 0.3	14.0	5.3	0.37
12	1 2.4	2 24 20.07	16 9 34.0	8.0	3.0	0.21	27	22 41.8	3 4 44.67	13 33 13.2	13.7	5.2	0.36
13	1 4.7	2 30 40.28	16 50 25.2	8.2	3.1	0.22	28	22 38.8	3 5 41.04	13 32 41.9	13.4	5.1	0.35
14	1 6.8	2 36 47.32	17 28 48.9	8.5	3.2	0.22	29	22 36.0	3 6 53.73	13 34 23.1	13.2	5.0	0.34
15	1 8.7	2 42 40.01	18 4 39.4	8.7	3.3	0.23	30	22 33.6	3 8 22.63	13 38 13.4	12.9	4.9	0.34
16	1 10.4	2 48 17.56	+18 37 53.0	8.9	3.4	0.24	31	22 31.4	3 10 7.56	+13 44 8.4	12.6	4.8	0.33
17	1 11.8	2 53 38.42	19 8 26.6	9.1	3.5	0.25	June 1	22 29.5	3 12 8.32	13 52 3.0	12.3	4.7	0.32
18	1 12.9	2 58 42.33	19 36 18.7	9.3	3.5	0.26	2	22 27.8	3 14 24.71	14 1 52.0	12.0	4.6	0.31
19	1 13.8	3 3 28.28	20 1 28.6	9.6	3.6	0.26	3	22 26.4	3 16 56.52	14 13 29.6	11.7	4.5	0.31
20	1 14.4	3 7 55.52	20 23 55.9	9.8	3.7	0.27	4	22 25.2	3 19 43.54	14 26 49.9	11.5	4.4	0.30
21	1 14.6	3 12 3.39	+20 43 40.5	10.1	3.8	0.28	5	22 24.3	3 22 45.60	+14 41 46.9	11.2	4.3	0.30
22	1 14.4	3 15 51.28	21 0 43.0	10.4	3.9	0.29	6	22 23.7	3 26 2.50	14 58 14.4	11.0	4.2	0.29
23	1 13.9	3 19 18.64	21 15 4.2	10.7	4.0	0.30	7	22 23.2	3 29 34.13	15 16 6.1	10.8	4.1	0.28
24	1 13.0	3 22 24.98	21 26 44.7	11.0	4.2	0.30	8	22 23.1	3 33 20.32	15 35 14.9	10.5	4.0	0.28
25	1 11.7	3 25 9.88	21 35 45.7	11.3	4.3	0.31	9	22 23.1	3 37 21.03	15 55 34.6	10.3	3.9	0.27
26	1 10.1	3 27 33.02	+21 42 8.3	11.6	4.4	0.32	10	22 23.5	3 41 36.22	+16 16 58.7	10.0	3.8	0.27
27	1 8.2	3 29 34.19	21 45 53.5	11.9	4.5	0.33	11	22 24.0	3 46 5.82	16 39 20.4	9.8	3.7	0.26
28	1 6.0	3 31 13.29	21 47 3.2	12.3	4.6	0.34	12	22 24.8	3 50 49.85	17 2 32.3	9.6	3.7	0.26
29	1 3.4	3 32 30.36	21 45 38.7	12.6	4.8	0.34	13	22 25.8	3 55 48.34	17 26 27.9	9.3	3.6	0.26
30	1 0.5	3 33 25.62	21 41 42.2	13.0	4.9	0.35	14	22 27.1	4 1 1.36	17 50 59.5	9.1	3.6	0.25
May 1	0 57.1	3 33 59.28	+21 35 16.5	13.3	5.0	0.36	15	22 28.6	4 6 28.97	+18 15 59.4	9.0	3.5	0.24
2	0 53.4	3 34 12.00	21 26 25.0	13.6	5.1	0.37	16	22 30.4	4 12 11.29	18 41 19.9	8.8	3.4	0.24
3	0 49.4	3 34 4.41	21 15 11.8	13.9	5.2	0.38	17	22 32.4	4 18 8.43	19 6 52.7	8.7	3.3	0.23
4	0 44.9	3 33 37.50	21 1 42.1	14.2	5.4	0.38	18	22 34.6	4 24 20.50	19 32 28.9	8.5	3.3	0.23
5	0 40.1	3 32 52.41	20 46 2.7	14.5	5.5	0.39	19	22 37.1	4 30 47.62	19 58 0.3	8.3	3.2	0.22
6	0 35.1	3 31 50.54	+20 28 21.2	14.7	5.6	0.39	20	22 39.9	4 37 29.86	+20 23 16.5	8.1	3.2	0.22
7	0 29.9	3 30 33.47	20 8 47.5	15.0	5.7	0.40	21	22 42.9	4 44 27.23	20 48 7.8	8.0	3.1	0.21
8	0 24.5	3 29 3.01	19 47 32.6	15.2	5.8	0.40	22	22 46.1	4 51 39.74	21 12 23.4	7.9	3.0	0.21
9	0 19.0	3 27 21.22	19 24 50.0	15.4	5.8	0.41	23	22 49.7	4 59 7.35	21 35 52.5	7.8	3.0	0.21
10	0 13.2	3 25 30.15	19 0 53.8	15.5	5.8	0.41	24	22 53.4	5 6 49.83	21 58 23.3	7.7	2.9	0.21
11	0 7.3	3 23 32.11	+18 36 0.4	15.6	5.9	0.41	25	22 57.4	5 14 46.90	+22 19 44.2	7.6	2.9	0.20
12	0 1.4	3 21 29.42	18 10 27.2	15.7	5.9	0.42	26	23 1.6	5 22 58.10	22 39 42.9	7.5	2.8	0.20
12 23 55.3	3 19 24.47	17 44 32.6	15.8	6.0	0.42	27	23 6.1	5 31 22.83	22 58 6.8	7.3	2.8	0.20	
13 23 49.3	3 17 19.65	17 18 34.8	15.9	6.0	0.42	28	23 10.8	5 40 0.36	23 14 44.0	7.2	2.8	0.20	
14 23 43.4	3 15 17.15	16 52 53.4	15.9	6.0	0.42	29	23 15.6	5 48 49.72	23 29 22.7	7.1	2.8	0.20	
15 23 37.5	3 13 19.19	+16 27 46.4	15.8	6.0	0.42	30	23 20.7	5 57 49.77	+23 41 51.3	7.0	2.7	0.19	
16 23 31.7	3 11 27.81	+16 3 32.0	15.8	6.0	0.42	July 1	23 25.9	6 6 59.22	+23 51 59.8	6.9	2.7	0.19	

## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid.T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid.T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
July 1	23 25.9	6 6 59.22	+23 51 59.8	6.9	2.7	0.19	Aug. 17	1 43.8	11 26 40.03	+1 49 17.9	9.2	3.5	0.23
2	23 31.2	6 16 16.54	23 59 39.1	6.8	2.6	0.19	18	1 43.4	11 30 12.06	1 15 26.1	9.3	3.5	0.23
3	23 36.7	6 25 40.12	24 4 41.2	6.8	2.6	0.19	19	1 42.8	11 33 34.41	0 42 32.3	9.4	3.6	0.24
4	23 42.2	6 35 8.29	24 7 0.8	6.7	2.6	0.19	20	1 42.1	11 36 46.66	+0 10 41.4	9.6	3.6	0.24
5	23 47.7	6 44 39.22	24 6 33.4	6.7	2.6	0.18	21	1 41.1	11 39 48.34	-0 20 0.6	9.8	3.7	0.25
6	23 53.3	6 54 11.18	+24 3 17.4	6.6	2.5	0.18	22	1 40.1	11 42 38.98	-0 49 28.5	10.0	3.8	0.26
7	23 58.8	7 3 42.41	23 57 12.7	6.6	2.5	0.18	23	1 38.8	11 45 17.97	1 17 35.2	10.1	3.8	0.26
9	0 4.3	7 13 11.17	23 48 21.0	6.6	2.5	0.18	24	1 37.3	11 47 44.72	1 44 14.2	10.3	3.9	0.26
10	0 9.7	7 22 36.01	23 36 46.2	6.6	2.5	0.18	25	1 35.6	11 49 58.56	2 9 18.0	10.4	3.9	0.27
11	0 15.0	7 31 55.44	23 22 33.4	6.6	2.5	0.18	26	1 33.6	11 51 58.75	2 32 38.6	10.6	4.0	0.27
12	0 20.3	7 41 8.27	+23 5 48.6	6.6	2.5	0.18	27	1 31.4	11 53 44.51	-2 54 7.1	10.9	4.1	0.27
13	0 25.5	7 50 13.47	22 46 39.5	6.6	2.5	0.18	28	1 29.0	11 55 15.08	3 13 34.7	11.1	4.2	0.27
14	0 30.5	7 59 10.06	22 25 14.1	6.7	2.5	0.18	29	1 26.3	11 56 29.53	3 30 51.0	11.4	4.2	0.28
15	0 35.3	8 7 57.31	22 1 41.0	6.7	2.5	0.18	30	1 23.4	11 57 27.01	3 45 46.0	11.6	4.3	0.28
16	0 39.9	8 16 34.68	21 36 9.1	6.7	2.5	0.18	31	1 20.1	11 58 6.63	3 58 8.2	11.8	4.4	0.29
17	0 44.4	8 25 1.74	+21 8 47.3	6.7	2.5	0.18	Sept. 1	1 16.5	11 58 27.51	-4 7 45.8	12.0	4.5	0.30
18	0 48.8	8 33 18.15	20 39 44.5	6.7	2.5	0.18	2	1 12.6	11 58 28.83	4 14 27.6	12.2	4.6	0.30
19	0 53.0	8 41 23.77	20 9 9.3	6.8	2.6	0.18	3	1 8.4	11 58 9.87	4 18 0.5	12.4	4.6	0.31
20	0 57.0	8 49 18.56	19 37 9.5	6.8	2.6	0.18	4	1 3.8	11 57 30.02	4 18 12.8	12.6	4.7	0.31
21	1 0.8	8 57 2.52	19 3 54.0	6.8	2.6	0.18	5	0 58.8	11 56 28.85	4 14 53.5	12.8	4.8	0.32
22	1 4.4	9 4 35.69	+18 29 29.9	6.9	2.6	0.18	6	0 53.5	11 55 6.23	-4 7 53.0	13.0	4.9	0.33
23	1 7.7	9 11 58.17	17 54 4.8	6.9	2.6	0.18	7	0 47.8	11 53 22.33	3 57 3.3	13.2	5.0	0.33
24	1 10.9	9 19 10.05	17 17 45.4	7.0	2.6	0.18	8	0 41.9	11 51 17.72	3 42 19.1	13.4	5.0	0.34
25	1 14.0	9 26 11.61	16 40 38.3	7.0	2.6	0.19	9	0 35.5	11 48 53.44	3 23 38.9	13.5	5.1	0.34
26	1 16.9	9 33 3.03	16 2 49.7	7.1	2.7	0.19	10	0 28.9	11 46 11.12	3 1 6.4	13.6	5.1	0.35
27	1 19.7	9 39 44.47	+15 24 25.1	7.2	2.7	0.19	11	0 22.0	11 43 12.91	-2 34 50.0	13.7	5.2	0.35
28	1 22.3	9 46 16.20	14 45 30.1	7.2	2.7	0.19	12	0 14.9	11 40 1.74	2 5 5.9	13.7	5.2	0.35
29	1 24.8	9 52 38.40	14 6 9.7	7.3	2.8	0.19	13	0 7.6	11 36 40.99	1 32 15.9	13.6	5.2	0.35
30	1 27.1	9 58 51.33	13 26 28.9	7.3	2.8	0.19	14	0 0.2	11 33 14.75	0 56 49.4	13.6	5.2	0.34
31	1 29.2	10 4 55.15	12 46 32.3	7.4	2.8	0.20	14	23 52.9	11 29 47.56	-0 19 22.9	13.5	5.2	0.34
Aug. 1	1 31.1	10 10 50.08	+12 6 24.0	7.5	2.8	0.20	15	23 45.6	11 26 24.30	+0 19 21.5	13.4	5.2	0.34
2	1 32.9	10 16 36.31	11 26 8.4	7.6	2.9	0.20	16	23 38.4	11 23 10.15	0 58 37.2	13.2	5.1	0.34
3	1 34.6	10 22 14.01	10 45 49.4	7.7	2.9	0.20	17	23 31.5	11 20 10.11	1 37 36.1	13.0	5.0	0.33
4	1 36.2	10 27 43.30	10 5 30.6	7.8	2.9	0.20	18	23 24.9	11 17 29.12	2 15 28.9	12.8	5.0	0.33
5	1 37.6	10 33 4.31	9 25 16.1	7.9	2.9	0.21	19	23 18.7	11 15 11.64	2 51 27.2	12.6	4.9	0.33
6	1 38.8	10 38 17.14	+ 8 45 9.2	8.0	3.0	0.21	20	23 13.0	11 13 21.65	+3 24 47.6	12.4	4.7	0.32
7	1 39.9	10 43 21.88	8 5 13.8	8.1	3.1	0.21	21	23 7.7	11 12 2.38	3 54 50.5	12.1	4.6	0.31
8	1 40.9	10 48 18.59	7 25 32.7	8.2	3.1	0.21	22	23 3.0	11 11 16.30	4 21 3.3	11.8	4.5	0.30
9	1 41.8	10 53 7.26	6 46 10.1	8.3	3.1	0.21	23	22 58.9	11 11 5.08	4 42 59.5	11.5	4.4	0.29
10	1 42.5	10 57 47.89	6 7 9.1	8.4	3.1	0.21	24	22 55.4	11 11 29.59	5 0 19.8	11.2	4.3	0.28
11	1 43.1	11 2 20.47	+ 5 28 33.5	8.5	3.1	0.22	25	22 52.4	11 12 29.90	+5 12 50.9	10.8	4.1	0.27
12	1 43.6	11 6 44.90	4 50 26.8	8.6	3.2	0.22	26	22 50.1	11 14 5.43	5 20 27.4	10.4	4.0	0.26
13	1 44.0	11 11 1.08	4 12 52.5	8.7	3.2	0.22	27	22 48.3	11 16 14.93	5 23 8.0	10.1	3.9	0.25
14	1 44.2	11 15 8.90	3 35 54.4	8.8	3.3	0.22	28	22 47.1	11 18 56.72	5 20 56.9	9.8	3.8	0.25
15	1 44.2	11 19 8.15	2 59 36.5	8.9	3.3	0.23	29	22 46.3	11 22 8.65	5 14 3.2	9.5	3.7	0.24
16	1 44.1	11 22 58.62	+ 2 24 2.9	9.0	3.4	0.23	30	22 46.0	11 25 48.31	+5 2 39.8	9.2	3.5	0.24
17	1 43.8	11 26 40.03	+ 1 49 17.9	9.2	3.5	0.23	Oct. 1	22 46.2	11 29 53.09	+4 47 1.8	9.0	3.4	0.23

## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Oct. 1	22 46.2	11 29 53.09	+ 4 47 1.8	9.0	3.4	0.23	Nov. 16	0 22.6	16 4 2.33	-22 10 41.0	6.3	2.4	0.17
2	22 46.7	11 34 20.33	4 27 26.5	8.7	3.3	0.23	17	0 25.1	16 10 29.96	22 33 26.2	6.3	2.4	0.17
3	22 47.5	11 39 7.38	4 4 13.0	8.5	3.2	0.22	18	0 27.6	16 16 58.73	22 55 4.1	6.4	2.4	0.18
4	22 48.6	11 44 11.62	3 37 41.4	8.3	3.1	0.22	19	0 30.2	16 23 28.59	23 15 33.0	6.4	2.4	0.18
5	22 50.0	11 49 30.55	3 8 11.9	8.1	3.1	0.21	20	0 32.8	16 29 59.42	23 34 51.6	6.4	2.4	0.18
6	22 51.6	11 55 1.91	+ 2 36 4.4	7.9	3.0	0.20	21	0 35.4	16 36 31.16	-23 52 58.4	6.5	2.4	0.18
7	22 53.3	12 0 43.60	2 1 38.5	7.7	3.0	0.20	22	0 38.0	16 43 3.65	24 9 51.7	6.5	2.5	0.18
8	22 55.2	12 6 33.78	1 25 13.1	7.5	2.9	0.19	23	0 40.6	16 49 36.79	24 25 30.5	6.5	2.5	0.18
9	22 57.2	12 12 30.73	0 47 5.9	7.4	2.9	0.18	24	0 43.2	16 56 10.37	24 39 53.1	6.6	2.5	0.18
10	22 59.3	12 18 33.12	+ 0 7 32.8	7.3	2.8	0.18	25	0 45.8	17 2 44.21	24 52 58.2	6.6	2.5	0.18
11	23 1.5	12 24 39.69	- 0 33 11.1	7.2	2.8	0.18	26	0 48.4	17 9 18.06	-25 4 44.3	6.7	2.5	0.18
12	23 3.7	12 30 49.41	1 14 52.0	7.1	2.7	0.18	27	0 51.0	17 15 51.63	25 15 10.0	6.7	2.5	0.19
13	23 5.9	12 37 1.47	1 57 17.5	7.0	2.7	0.17	28	0 53.6	17 22 24.59	25 24 14.1	6.8	2.6	0.19
14	23 8.2	12 43 15.10	2 40 16.6	6.9	2.6	0.17	29	0 56.2	17 28 56.53	25 31 55.3	6.8	2.6	0.19
15	23 10.5	12 49 29.78	3 23 39.2	6.8	2.6	0.17	30	0 58.7	17 35 27.05	25 38 12.7	6.9	2.6	0.19
16	23 12.8	12 55 45.08	- 4 7 16.8	6.7	2.5	0.17	Dec. 1	1 1.2	17 41 55.62	-25 43 4.8	7.0	2.6	0.20
17	23 15.1	13 2 0.65	4 51 1.6	6.6	2.5	0.17	2	1 3.7	17 48 21.68	25 46 31.1	7.1	2.7	0.20
18	23 17.4	13 8 16.25	5 34 46.8	6.5	2.5	0.16	3	1 6.1	17 54 44.58	25 48 30.7	7.2	2.7	0.21
19	23 19.7	13 14 31.70	6 18 26.1	6.5	2.5	0.16	4	1 8.5	18 1 3.59	25 49 3.4	7.3	2.8	0.22
20	23 22.0	13 20 46.86	7 1 54.1	6.4	2.5	0.16	5	1 10.8	18 7 17.83	25 48 8.8	7.4	2.8	0.22
21	23 24.3	13 27 1.65	- 7 45 6.2	6.4	2.5	0.16	6	1 13.0	18 13 26.37	-25 45 47.2	7.5	2.8	0.22
22	23 26.6	13 33 16.05	8 27 58.0	6.4	2.4	0.16	7	1 15.1	18 19 28.10	25 41 58.1	7.6	2.9	0.22
23	23 28.9	13 39 30.06	9 10 25.6	6.3	2.4	0.16	8	1 17.0	18 25 21.83	25 36 43.6	7.7	2.9	0.23
24	23 31.2	13 45 43.71	9 52 25.7	6.3	2.4	0.16	9	1 18.8	18 31 6.15	25 30 4.7	7.9	3.0	0.23
25	23 33.5	13 51 57.06	10 33 55.3	6.2	2.4	0.16	10	1 20.4	18 36 39.46	25 22 3.3	8.1	3.1	0.23
26	23 35.7	13 58 10.16	-11 14 51.9	6.2	2.4	0.16	11	1 21.8	18 42 0.02	-25 12 42.2	8.3	3.1	0.23
27	23 37.9	14 4 23.10	11 55 13.0	6.2	2.4	0.16	12	1 23.0	18 47 5.75	25 2 4.6	8.5	3.2	0.24
28	23 40.2	14 10 35.96	12 34 56.2	6.1	2.3	0.16	13	1 23.9	18 51 54.46	24 50 15.0	8.7	3.2	0.24
29	23 42.5	14 16 48.88	13 13 59.5	6.1	2.3	0.16	14	1 24.4	18 56 23.70	24 37 18.6	8.9	3.3	0.25
30	23 44.8	14 23 1.92	13 52 21.0	6.1	2.3	0.16	15	1 24.6	19 0 30.68	24 23 21.7	9.1	3.4	0.25
31	23 47.0	14 29 15.20	-14 29 59.1	6.1	2.3	0.16	16	1 24.3	19 4 12.36	-24 8 31.9	9.3	3.5	0.26
Nov. 1	23 49.3	14 35 28.81	15 6 51.9	6.1	2.3	0.16	17	1 23.6	19 7 25.50	23 52 57.2	9.5	3.6	0.26
2	23 51.6	14 41 42.85	15 42 58.0	6.1	2.3	0.16	18	1 22.3	19 10 6.61	23 36 47.7	9.8	3.7	0.27
3	23 53.9	14 47 57.39	16 18 15.7	6.1	2.3	0.16	19	1 20.5	19 12 12.08	23 20 13.2	10.1	3.8	0.27
4	23 56.2	14 54 12.60	16 52 44.0	6.1	2.3	0.16	20	1 18.0	19 13 38.34	23 3 25.2	10.4	3.9	0.28
5	23 58.5	15 0 28.55	-17 26 20.7	6.1	2.3	0.16	21	1 14.8	19 14 21.77	-22 46 35.1	10.7	4.0	0.28
7	0 0.8	15 6 45.29	17 59 5.2	6.1	2.3	0.16	22	1 10.8	19 14 19.33	22 29 54.8	11.0	4.1	0.29
8	0 3.2	15 13 2.91	18 30 55.9	6.1	2.3	0.16	23	1 6.0	19 13 28.49	22 13 35.4	11.3	4.2	0.30
9	0 5.6	15 19 21.48	19 1 51.4	6.1	2.3	0.16	24	1 0.4	19 11 47.80	21 57 47.1	11.6	4.3	0.31
10	0 8.0	15 25 41.09	19 31 50.3	6.1	2.3	0.16	25	0 54.0	19 9 17.10	21 42 38.8	11.9	4.5	0.32
11	0 10.4	15 32 1.76	-20 0 51.3	6.1	2.3	0.16	26	0 46.8	19 5 57.96	-21 28 18.5	12.2	4.6	0.33
12	0 12.8	15 38 23.55	20 28 53.2	6.2	2.3	0.16	27	0 38.8	19 1 53.95	21 14 52.2	12.4	4.7	0.34
13	0 15.2	15 44 46.48	20 55 54.6	6.2	2.3	0.17	28	0 30.2	18 57 10.79	21 2 25.2	12.6	4.8	0.34
14	0 17.6	15 51 10.59	21 21 53.7	6.2	2.4	0.17	29	0 21.0	18 51 56.25	20 51 2.2	12.8	4.9	0.35
15	0 20.1	15 57 35.87	21 46 49.7	6.2	2.4	0.17	30	0 11.5	18 46 19.85	20 40 47.5	13.0	4.9	0.35
16	0 22.6	16 4 2.33	-22 10 41.0	6.3	2.4	0.17	31	0 1.8	18 40 32.23	-20 31 45.9	13.2	5.0	0.36
17	0 25.1	16 10 29.96	-22 33 26.2	6.3	2.4	0.17	31	23 52.1	18 34 44.54	-20 24 3.4	13.3	5.0	0.36

## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid. T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Jan. 0	20 57.4	15 36 39.28	-16 41 19.8	9.5	9.2	0.64	Feb. 15	21 49.1	19 29 49.55	-21 14 13.6	7.2	6.9	0.49
1	20 58.2	15 41 21.38	16 58 25.2	9.4	9.1	0.64	16	21 50.4	19 35 1.26	21 6 6.1	7.1	6.9	0.49
2	20 59.0	15 46 4.87	17 15 10.3	9.3	9.0	0.63	17	21 51.6	19 40 12.47	20 57 21.5	7.1	6.8	0.48
3	20 59.8	15 50 49.74	17 31 34.5	9.2	9.0	0.63	18	21 52.8	19 45 23.15	20 48 0.0	7.0	6.8	0.48
4	21 0.6	15 55 36.00	17 47 36.9	9.1	8.9	0.62	19	21 54.0	19 50 33.26	20 38 2.0	7.0	6.8	0.48
5	21 1.5	16 0 23.62	18 3 16.8	9.1	8.9	0.62	20	21 55.2	19 55 42.75	-20 27 27.8	7.0	6.8	0.48
6	21 2.4	16 5 12.60	18 18 33.2	9.0	8.8	0.62	21	21 56.4	20 0 51.58	20 16 17.7	6.9	6.8	0.47
7	21 3.3	16 10 2.91	18 33 25.5	8.9	8.8	0.62	22	21 57.6	20 5 59.72	20 4 32.1	6.9	6.7	0.47
8	21 4.2	16 14 54.53	18 47 52.8	8.9	8.7	0.61	23	21 58.8	20 11 7.13	19 52 11.4	6.8	6.7	0.47
9	21 5.1	16 19 47.45	19 1 54.3	8.8	8.7	0.61	24	22 0.0	20 16 13.77	19 39 16.0	6.8	6.7	0.47
10	21 6.1	16 24 41.63	19 15 29.4	8.8	8.6	0.60	25	22 1.1	20 21 19.62	19 25 46.3	6.8	6.7	0.47
11	21 7.1	16 29 37.05	19 28 37.3	8.7	8.6	0.60	26	22 2.3	20 26 24.65	19 11 42.8	6.8	6.6	0.46
12	21 8.1	16 34 33.69	19 41 17.4	8.7	8.5	0.60	27	22 3.4	20 31 28.86	18 57 5.9	6.7	6.6	0.46
13	21 9.1	16 39 31.50	19 53 28.8	8.6	8.5	0.59	28	22 4.5	20 36 32.20	18 41 56.2	6.7	6.5	0.46
14	21 10.1	16 44 30.46	20 5 10.9	8.5	8.4	0.59	29	22 5.6	20 41 34.66	18 26 14.2	6.7	6.5	0.46
15	21 11.2	16 49 30.54	20 16 23.1	8.5	8.3	0.58	Mar. 1	22 6.7	20 46 36.22	-18 10 0.4	6.7	6.5	0.45
16	21 12.2	16 54 31.70	20 27 4.6	8.4	8.3	0.58	2	22 7.7	20 51 36.89	17 53 15.2	6.6	6.4	0.45
17	21 13.3	16 59 33.89	20 37 14.9	8.4	8.2	0.58	3	22 8.8	20 56 36.63	17 35 59.4	6.6	6.4	0.45
18	21 14.4	17 4 37.08	20 46 53.4	8.4	8.2	0.57	4	22 9.8	21 1 35.44	17 18 13.3	6.5	6.3	0.44
19	21 15.5	17 9 41.24	20 55 59.4	8.3	8.1	0.57	5	22 10.8	21 6 33.31	16 59 57.7	6.5	6.3	0.44
20	21 16.6	17 14 46.33	21 4 32.3	8.3	8.0	0.57	6	22 11.8	21 11 30.22	-16 41 13.1	6.5	6.3	0.44
21	21 17.8	17 19 52.29	21 12 31.9	8.3	8.0	0.57	7	22 12.8	21 16 26.18	16 22 0.1	6.5	6.3	0.44
22	21 18.9	17 24 59.08	21 19 57.4	8.2	7.9	0.56	8	22 13.8	21 21 21.17	16 2 19.3	6.4	6.2	0.43
23	21 20.1	17 30 6.69	21 26 48.7	8.2	7.9	0.56	9	22 14.8	21 26 15.19	15 42 11.4	6.4	6.2	0.43
24	21 21.3	17 35 15.03	21 33 4.9	8.1	7.8	0.55	10	22 15.7	21 31 8.25	15 21 37.1	6.4	6.2	0.43
25	21 22.5	17 40 24.10	21 38 45.7	8.0	7.8	0.55	11	22 16.6	21 36 0.33	-15 0 36.9	6.4	6.2	0.43
26	21 23.7	17 45 33.82	21 43 50.7	8.0	7.7	0.55	12	22 17.5	21 40 51.44	14 39 11.5	6.4	6.1	0.42
27	21 24.9	17 50 44.16	21 48 19.6	7.9	7.7	0.54	13	22 18.4	21 45 41.58	14 17 21.6	6.3	6.1	0.42
28	21 26.2	17 55 55.06	21 52 12.0	7.9	7.6	0.54	14	22 19.3	21 50 30.76	13 55 7.9	6.3	6.1	0.42
29	21 27.5	18 1 6.48	21 55 27.4	7.8	7.6	0.54	15	22 20.1	21 55 18.99	13 32 31.1	6.3	6.1	0.42
30	21 28.7	18 6 18.37	21 58 5.7	7.8	7.5	0.54	16	22 21.0	22 0 6.26	-13 9 31.8	6.3	6.1	0.42
31	21 30.0	18 11 30.67	22 0 6.8	7.8	7.4	0.53	17	22 21.8	22 4 52.61	12 46 10.8	6.3	6.1	0.41
Feb. 1	21 31.2	18 16 43.35	22 1 30.3	7.7	7.4	0.53	18	22 22.6	22 9 38.04	12 22 28.6	6.2	6.0	0.41
2	21 32.5	18 21 56.36	22 2 16.0	7.7	7.4	0.53	19	22 23.4	22 14 22.55	11 58 26.1	6.2	6.0	0.41
3	21 33.8	18 27 9.64	22 2 23.7	7.6	7.3	0.52	20	22 24.2	22 19 6.16	11 34 3.8	6.2	6.0	0.41
4	21 35.0	18 32 23.13	22 1 53.3	7.6	7.3	0.52	21	22 24.9	22 23 48.91	-11 9 22.4	6.2	6.0	0.41
5	21 36.3	18 37 36.78	22 0 44.6	7.6	7.3	0.52	22	22 25.7	22 28 30.81	10 44 22.8	6.2	6.0	0.41
6	21 37.6	18 42 50.52	21 58 57.6	7.5	7.2	0.51	23	22 26.4	22 33 11.89	10 19 5.5	6.1	5.9	0.40
7	21 38.9	18 48 4.31	21 56 32.2	7.5	7.2	0.51	24	22 27.2	22 37 52.16	9 53 31.2	6.1	5.9	0.40
8	21 40.2	18 53 18.09	21 53 28.5	7.4	7.1	0.51	25	22 27.9	22 42 31.63	9 27 40.7	6.1	5.9	0.40
9	21 41.5	18 58 31.79	21 49 46.4	7.4	7.1	0.51	26	22 28.6	22 47 10.35	-9 1 34.5	6.1	5.9	0.40
10	21 42.8	19 3 45.39	21 45 26.0	7.4	7.1	0.50	27	22 29.3	22 51 48.35	8 35 13.4	6.1	5.9	0.39
11	21 44.1	19 8 58.79	21 40 27.4	7.3	7.0	0.50	28	22 30.0	22 56 25.66	8 8 38.1	6.0	5.8	0.39
12	21 45.4	19 14 11.97	21 34 50.7	7.3	7.0	0.50	29	22 30.7	23 1 2.31	7 41 49.3	6.0	5.8	0.39
13	21 46.6	19 19 24.86	21 28 36.1	7.2	6.9	0.49	30	22 31.4	23 5 38.32	7 14 47.6	6.0	5.8	0.39
14	21 47.9	19 24 37.40	21 21 43.7	7.2	6.9	0.49	31	22 32.1	23 10 13.75	6 47 33.8	6.0	5.8	0.39
15	21 49.1	19 29 49.55	21 14 13.6	7.2	6.9	0.49	Apr. 1	22 32.7	23 14 48.61	6 20 8.5	6.0	5.8	0.38



## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid.T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Apr. 1	22 32.7	23 14 48.61	6 20 8.5	6.0	5.8	0.38	May 17	23 2.2	2 45 47.52	+14 48 27.0	5.3	5.1	0.35
2	22 33.3	23 19 22.95	5 52 32.2	6.0	5.8	0.38	18	23 3.0	2 50 36.44	15 11 47.5	5.3	5.1	0.35
3	22 33.9	23 23 56.79	5 24 45.8	5.9	5.7	0.38	19	23 3.9	2 55 26.41	15 34 45.8	5.3	5.1	0.35
4	22 34.5	23 28 30.18	4 56 50.0	5.9	5.7	0.38	20	23 4.8	3 0 17.44	15 57 21.1	5.3	5.1	0.35
5	22 35.1	23 33 3.14	4 28 45.5	5.9	5.7	0.38	21	23 5.7	3 5 9.53	16 19 32.6	5.3	5.1	0.35
6	22 35.7	23 37 35.70	4 0 32.9	5.9	5.7	0.38	22	23 6.6	3 10 2.70	+16 41 19.7	5.2	5.1	0.35
7	22 36.3	23 42 7.91	3 32 13.0	5.8	5.6	0.37	23	23 7.6	3 14 56.96	17 2 41.6	5.2	5.1	0.35
8	22 36.9	23 46 39.80	3 3 46.4	5.8	5.6	0.37	24	23 8.6	3 19 52.32	17 23 37.6	5.2	5.1	0.35
9	22 37.5	23 51 11.41	2 35 13.9	5.8	5.6	0.37	25	23 9.6	3 24 48.80	17 44 7.0	5.2	5.1	0.35
10	22 38.1	23 55 42.77	2 6 36.1	5.8	5.6	0.37	26	23 10.6	3 29 46.41	18 4 9.2	5.2	5.1	0.35
11	22 38.6	0 0 13.92	1 37 53.7	5.8	5.5	0.37	27	23 11.6	3 34 45.14	+18 23 43.4	5.2	5.1	0.35
12	22 39.2	0 4 44.88	1 9 7.4	5.7	5.5	0.37	28	23 12.7	3 39 45.00	18 42 49.0	5.2	5.1	0.35
13	22 39.7	0 9 15.70	0 40 18.0	5.7	5.5	0.37	29	23 13.8	3 44 45.99	19 1 25.2	5.2	5.1	0.35
14	22 40.3	0 13 46.42	0 11 26.2	5.7	5.5	0.36	30	23 14.9	3 49 48.11	19 19 31.3	5.2	5.0	0.35
15	22 40.9	0 18 17.07	0 17 27.5	5.7	5.5	0.36	31	23 16.0	3 54 51.35	19 37 6.7	5.2	5.0	0.35
16	22 41.4	0 22 47.70	0 46 22.2	5.7	5.5	0.36	June 1	23 17.1	3 59 55.70	+19 54 10.9	5.2	5.0	0.35
17	22 42.0	0 27 18.33	1 15 17.3	5.6	5.5	0.36	2	23 18.2	4 5 1.15	20 10 43.2	5.2	5.0	0.35
18	22 42.6	0 31 49.01	1 44 12.2	5.6	5.5	0.36	3	23 19.4	4 10 7.70	20 26 42.8	5.2	5.0	0.36
19	22 43.2	0 36 19.76	2 13 6.1	5.6	5.5	0.36	4	23 20.6	4 15 15.32	20 42 9.1	5.2	5.0	0.36
20	22 43.7	0 40 50.62	2 41 58.3	5.6	5.4	0.36	5	23 21.8	4 20 24.00	20 57 1.6	5.2	5.0	0.36
21	22 44.3	0 45 21.64	3 10 47.9	5.6	5.4	0.36	6	23 23.0	4 25 33.72	+21 11 19.6	5.1	5.0	0.36
22	22 44.8	0 49 52.84	3 39 34.5	5.6	5.4	0.36	7	23 24.2	4 30 44.44	21 25 2.5	5.1	5.0	0.36
23	22 45.4	0 54 24.27	4 8 17.2	5.6	5.4	0.36	8	23 25.4	4 35 56.15	21 38 9.9	5.1	5.0	0.36
24	22 46.0	0 58 55.98	4 36 55.5	5.6	5.4	0.36	9	23 26.7	4 41 8.82	21 50 41.0	5.1	5.0	0.36
25	22 46.6	1 3 28.01	5 5 28.7	5.6	5.4	0.36	10	23 28.0	4 46 22.41	22 2 35.4	5.1	5.0	0.36
26	22 47.2	1 8 0.40	5 33 56.1	5.6	5.4	0.36	11	23 29.3	4 51 36.89	+22 13 52.5	5.1	5.0	0.36
27	22 47.8	1 12 33.19	6 2 17.0	5.5	5.3	0.36	12	23 30.6	4 56 52.24	22 24 31.8	5.1	5.0	0.36
28	22 48.4	1 17 6.42	6 30 30.8	5.5	5.3	0.36	13	23 31.9	5 2 8.38	22 34 33.0	5.1	5.0	0.36
29	22 49.0	1 21 40.14	6 58 36.7	5.5	5.3	0.36	14	23 33.3	5 7 25.30	22 43 55.5	5.1	5.0	0.36
30	22 49.6	1 26 14.36	7 26 34.0	5.5	5.3	0.36	15	23 34.6	5 12 42.93	22 52 38.9	5.1	5.0	0.36
May 1	22 50.3	1 30 49.12	7 54 29.1	5.5	5.3	0.36	16	23 36.0	5 18 1.25	+23 0 42.8	5.1	5.0	0.36
2	22 50.9	1 35 24.47	8 22 0.2	5.4	5.3	0.36	17	23 37.4	5 23 20.20	23 8 6.7	5.1	5.0	0.36
3	22 51.6	1 40 0.44	8 49 27.5	5.4	5.3	0.36	18	23 38.7	5 28 39.72	23 14 50.4	5.1	5.0	0.36
4	22 52.2	1 44 37.08	9 16 43.5	5.4	5.3	0.36	19	23 40.1	5 33 59.77	23 20 53.5	5.1	4.9	0.36
5	22 52.9	1 49 14.41	9 43 47.4	5.4	5.2	0.35	20	23 41.5	5 39 20.30	23 26 15.7	5.1	4.9	0.36
6	22 53.6	1 53 52.48	+10 10 38.5	5.4	5.2	0.35	21	23 42.9	5 44 41.27	+23 30 56.7	5.1	4.9	0.36
7	22 54.3	1 58 31.31	10 37 16.0	5.4	5.2	0.35	22	23 44.3	5 50 2.62	23 34 56.3	5.1	4.9	0.36
8	22 55.0	2 3 10.95	11 3 39.2	5.4	5.2	0.35	23	23 45.7	5 55 24.29	23 38 14.2	5.1	4.9	0.36
9	22 55.8	2 7 51.40	11 29 47.4	5.4	5.2	0.35	24	23 47.2	6 0 46.23	23 40 50.3	5.1	4.9	0.36
10	22 56.5	2 12 32.68	11 55 40.0	5.4	5.2	0.35	25	23 48.6	6 6 8.37	23 42 44.5	5.1	4.9	0.36
11	22 57.3	2 17 14.84	+12 21 16.2	5.4	5.2	0.35	26	23 50.0	6 11 30.67	+23 43 56.5	5.1	4.9	0.36
12	22 58.0	2 21 57.90	12 46 35.1	5.3	5.2	0.35	27	23 51.5	6 16 53.08	23 44 26.4	5.1	4.9	0.36
13	22 58.8	2 26 41.89	13 11 36.2	5.3	5.2	0.35	28	23 52.9	6 22 15.53	23 44 13.9	5.1	4.9	0.36
14	22 59.6	2 31 26.82	13 36 18.7	5.3	5.2	0.35	29	23 54.4	6 27 37.98	23 43 19.1	5.1	4.9	0.36
15	23 0.4	2 36 12.72	14 0 41.8	5.3	5.1	0.35	30	23 55.8	6 33 0.36	23 41 42.0	5.1	4.9	0.36
16	23 1.3	2 40 59.62	+14 24 44.8	5.3	5.1	0.35	July 1	23 57.2	6 38 22.64	+23 39 22.6	5.1	4.9	0.36
17	23 2.2	2 45 47.52	+14 48 27.0	5.3	5.1	0.35	2	23 58.6	6 43 44.74	+23 36 21.0	5.1	4.9	0.36

## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid.T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid.T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
July 1	23 57.2	6 38 22.64	+23 39 22.6	5.1	4.9	0.36	Aug. 16	0 48.0	10 26 45.13	+11 17 27.0	5.2	5.1	0.35
2	23 58.6	6 43 44.74	23 36 21.0	5.1	4.9	0.36	17	0 48.7	10 31 25.99	10 50 10.6	5.2	5.1	0.35
4	0 0.0	6 49 6.60	23 32 37.3	5.1	4.9	0.36	18	0 49.4	10 36 5.96	10 22 36.8	5.2	5.1	0.35
5	0 1.4	6 54 28.16	23 28 11.5	5.1	4.9	0.36	19	0 50.1	10 40 45.07	9 54 46.4	5.2	5.1	0.35
6	0 2.8	6 59 49.37	23 23 3.8	5.1	4.9	0.36	20	0 50.8	10 45 23.34	9 26 40.2	5.2	5.1	0.35
7	0 4.2	7 5 10.17	+23 17 14.4	5.1	4.9	0.36	21	0 51.5	10 50 0.81	+ 8 58 18.8	5.2	5.1	0.35
8	0 5.6	7 10 30.52	23 10 43.4	5.1	4.9	0.36	22	0 52.2	10 54 37.52	8 29 43.0	5.3	5.1	0.35
9	0 7.0	7 15 50.36	23 3 31.3	5.1	4.9	0.36	23	0 52.9	10 59 13.50	8 0 53.6	5.3	5.1	0.35
10	0 8.4	7 21 9.64	22 55 38.2	5.1	4.9	0.36	24	0 53.6	11 3 48.78	7 31 51.2	5.3	5.1	0.35
11	0 9.7	7 26 28.30	22 47 4.4	5.1	4.9	0.36	25	0 54.2	11 8 23.41	7 2 36.5	5.3	5.1	0.35
12	0 11.1	7 31 46.31	+22 37 50.3	5.1	4.9	0.36	26	0 54.8	11 12 57.42	+ 6 33 10.3	5.3	5.1	0.35
13	0 12.4	7 37 3.61	22 27 56.2	5.1	4.9	0.35	27	0 55.4	11 17 30.85	6 3 33.4	5.3	5.1	0.35
14	0 13.7	7 42 20.15	22 17 22.4	5.1	4.9	0.35	28	0 56.0	11 22 3.74	5 33 46.2	5.3	5.2	0.35
15	0 15.0	7 47 35.88	22 6 9.5	5.1	4.9	0.35	29	0 56.6	11 26 36.14	5 3 49.7	5.3	5.2	0.35
16	0 16.3	7 52 50.77	21 54 17.6	5.1	4.9	0.35	30	0 57.2	11 31 8.09	4 33 44.6	5.3	5.2	0.35
17	0 17.6	7 58 4.77	+21 41 47.4	5.1	4.9	0.35	31	0 57.8	11 35 39.62	+ 4 3 31.6	5.3	5.2	0.35
18	0 18.9	8 3 17.84	21 28 39.2	5.1	4.9	0.35	Sept. 1	0 58.3	11 40 10.77	3 33 11.5	5.3	5.2	0.35
19	0 20.1	8 8 29.95	21 14 53.7	5.1	4.9	0.35	2	0 58.9	11 44 41.60	3 2 44.8	5.4	5.2	0.35
20	0 21.4	8 13 41.07	21 0 31.4	5.1	4.9	0.35	3	0 59.5	11 49 12.14	2 32 12.3	5.4	5.2	0.35
21	0 22.6	8 18 51.17	20 45 32.7	5.1	4.9	0.35	4	1 0.0	11 53 47.43	2 1 34.8	5.4	5.2	0.35
22	0 23.9	8 24 0.24	+20 29 58.3	5.1	4.9	0.35	5	1 0.6	11 58 12.51	+ 1 30 52.9	5.4	5.2	0.35
23	0 25.1	8 29 8.23	20 13 48.5	5.1	5.0	0.35	6	1 1.1	12 2 42.42	1 0 7.3	5.4	5.2	0.35
24	0 26.3	8 34 15.14	19 57 4.0	5.1	5.0	0.35	7	1 1.6	12 7 12.23	+ 0 29 18.9	5.4	5.3	0.35
25	0 27.4	8 39 20.95	19 39 45.5	5.1	5.0	0.35	8	1 2.2	12 11 41.97	0 1 31.7	5.4	5.3	0.35
26	0 28.5	8 44 25.65	19 21 53.5	5.1	5.0	0.35	9	1 2.7	12 16 11.67	0 32 23.8	5.4	5.3	0.35
27	0 29.6	8 49 29.22	+19 3 28.6	5.1	5.0	0.35	10	1 3.3	12 20 41.37	- 1 3 16.5	5.4	5.3	0.35
28	0 30.7	8 54 31.66	18 44 31.6	5.1	5.0	0.35	11	1 3.9	12 25 11.12	1 34 9.0	5.5	5.3	0.36
29	0 31.8	8 59 32.96	18 25 3.0	5.1	5.0	0.35	12	1 4.4	12 29 40.96	2 5 0.9	5.5	5.3	0.36
30	0 32.8	9 4 33.10	18 5 3.4	5.1	5.0	0.35	13	1 5.0	12 34 10.92	2 35 51.3	5.5	5.3	0.36
31	0 33.9	9 9 32.09	17 44 33.5	5.1	5.0	0.35	14	1 5.5	12 38 41.04	3 6 39.5	5.5	5.3	0.36
Aug. 1	0 34.9	9 14 29.93	+17 23 34.0	5.1	5.0	0.35	15	1 6.1	12 43 11.36	- 3 37 24.7	5.5	5.3	0.36
2	0 35.9	9 19 26.62	17 2 5.4	5.1	5.0	0.35	16	1 6.7	12 47 41.92	4 8 6.1	5.5	5.4	0.36
3	0 36.9	9 24 22.18	16 40 8.6	5.1	5.0	0.35	17	1 7.2	12 52 12.76	4 38 43.0	5.5	5.4	0.36
4	0 37.8	9 29 16.59	16 17 44.3	5.1	5.0	0.35	18	1 7.8	12 56 43.94	5 9 14.7	5.6	5.4	0.36
5	0 38.8	9 34 9.87	15 54 53.3	5.1	5.0	0.35	19	1 8.4	13 1 15.50	5 39 40.4	5.6	5.4	0.36
6	0 39.7	9 39 2.03	+15 31 36.3	5.1	5.0	0.35	20	1 9.0	13 5 47.49	- 6 9 59.4	5.6	5.5	0.36
7	0 40.6	9 43 53.09	15 7 53.9	5.2	5.0	0.35	21	1 9.6	13 10 19.95	6 40 11.2	5.6	5.5	0.37
8	0 41.5	9 48 43.05	14 43 46.7	5.2	5.0	0.35	22	1 10.2	13 14 52.90	7 10 14.9	5.6	5.5	0.37
9	0 42.4	9 53 31.93	14 19 15.5	5.2	5.0	0.35	23	1 10.8	13 19 26.39	7 40 9.6	5.6	5.5	0.37
10	0 43.2	9 58 19.74	13 54 21.0	5.2	5.0	0.35	24	1 11.4	13 24 0.47	8 9 54.5	5.6	5.5	0.37
11	0 44.1	10 3 6.49	+13 29 3.9	5.2	5.0	0.35	25	1 12.0	13 28 35.16	- 8 39 29.0	5.7	5.5	0.37
12	0 44.9	10 7 52.21	13 3 25.0	5.2	5.0	0.35	26	1 12.7	13 33 10.50	9 8 52.4	5.7	5.5	0.37
13	0 45.7	10 12 36.91	12 37 25.0	5.2	5.1	0.35	27	1 13.3	13 37 46.55	9 38 3.9	5.7	5.5	0.37
14	0 46.5	10 17 20.62	12 11 4.9	5.2	5.1	0.35	28	1 14.0	13 42 23.35	10 7 2.8	5.7	5.5	0.37
15	0 47.3	10 22 3.35	11 44 25.3	5.2	5.1	0.35	29	1 14.7	13 47 0.95	10 35 48.3	5.7	5.5	0.37
16	0 48.0	10 26 45.13	+11 17 27.0	5.2	5.1	0.35	30	1 15.4	13 51 39.39	-11 4 19.7	5.7	5.5	0.37
17	0 48.7	10 31 25.99	+10 50 10.6	5.2	5.1	0.35	Oct. 1	1 16.1	13 56 18.67	-11 32 36.2	5.7	5.6	0.37

## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Oct. 1	1 16.1	13 56 18.67	-11 32 36.2	5.7	5.6	0.37	Nov. 16	2 8.0	17 49 47.34	-25 5 6.7	6.7	6.6	0.48
2	1 16.8	14 0 58.84	12 0 37.1	5.7	5.6	0.37	17	2 9.5	17 55 11.55	25 8 0.5	6.8	6.6	0.48
3	1 17.6	14 5 39.94	12 28 21.4	5.7	5.6	0.38	18	2 10.9	18 0 35.85	25 10 9.5	6.8	6.7	0.49
4	1 18.3	14 10 22.00	12 55 48.4	5.7	5.6	0.38	19	2 12.4	18 6 0.16	25 11 33.6	6.9	6.7	0.49
5	1 19.1	14 15 5.07	13 22 57.5	5.8	5.6	0.38	20	2 13.9	18 11 24.41	25 12 12.6	6.9	6.7	0.49
6	1 19.9	14 19 49.15	-13 49 47.7	5.8	5.7	0.38	21	2 15.4	18 16 48.55	-25 12 6.6	6.9	6.7	0.49
7	1 20.7	14 24 34.29	14 16 18.2	5.8	5.7	0.38	22	2 16.8	18 22 12.50	25 11 15.4	6.9	6.7	0.49
8	1 21.5	14 29 20.49	14 42 28.5	5.8	5.7	0.38	23	2 18.3	18 27 36.19	25 9 39.0	7.0	6.8	0.50
9	1 22.3	14 34 7.78	15 8 17.7	5.9	5.7	0.39	24	2 19.7	18 32 59.54	25 7 17.5	7.0	6.8	0.50
10	1 23.2	14 38 56.18	15 33 45.0	5.9	5.7	0.39	25	2 21.1	18 38 22.49	25 4 11.1	7.0	6.8	0.50
11	1 24.1	14 43 45.71	-15 58 49.6	5.9	5.7	0.39	26	2 22.6	18 43 44.98	-25 0 19.9	7.0	6.8	0.50
12	1 25.0	14 48 36.39	16 23 30.7	5.9	5.8	0.39	27	2 24.0	18 49 6.94	24 55 44.4	7.1	6.9	0.50
13	1 25.9	14 53 28.23	16 47 47.3	5.9	5.8	0.40	28	2 25.4	18 54 28.29	24 50 24.5	7.1	6.9	0.51
14	1 26.9	14 58 21.25	17 11 38.7	6.0	5.8	0.40	29	2 26.8	18 59 48.98	24 44 20.6	7.2	7.0	0.51
15	1 27.8	15 3 15.46	17 35 4.1	6.0	5.8	0.40	30	2 28.2	19 5 8.94	24 37 32.9	7.2	7.0	0.51
16	1 28.8	15 8 10.86	-17 58 2.8	6.0	5.8	0.41	Dec. 1	2 29.6	19 10 28.11	-24 30 1.7	7.2	7.0	0.51
17	1 29.8	15 13 7.46	18 20 34.0	6.0	5.8	0.41	2	2 30.9	19 15 46.44	24 21 47.2	7.3	7.1	0.51
18	1 30.8	15 18 5.28	18 42 35.9	6.0	5.8	0.41	3	2 32.3	19 21 3.86	24 12 49.9	7.3	7.1	0.52
19	1 31.9	15 23 4.32	19 4 10.8	6.0	5.9	0.41	4	2 33.6	19 26 20.34	24 3 10.1	7.4	7.2	0.52
20	1 32.9	15 28 4.58	19 25 14.9	6.1	5.9	0.41	5	2 34.9	19 31 35.80	23 52 48.5	7.4	7.2	0.52
21	1 34.0	15 33 6.07	-19 45 48.6	6.1	5.9	0.42	6	2 36.2	19 36 50.17	-23 41 45.4	7.4	7.2	0.52
22	1 35.1	15 38 8.76	20 5 50.9	6.1	5.9	0.42	7	2 37.5	19 42 3.39	23 30 1.3	7.5	7.3	0.52
23	1 36.2	15 43 12.66	20 25 21.0	6.1	5.9	0.42	8	2 38.7	19 47 15.42	23 17 36.8	7.5	7.3	0.53
24	1 37.4	15 48 17.76	20 44 18.3	6.1	6.0	0.42	9	2 40.0	19 52 26.20	23 4 32.4	7.6	7.4	0.53
25	1 38.5	15 53 24.04	21 2 42.0	6.2	6.0	0.43	10	2 41.2	19 57 35.70	22 50 48.6	7.6	7.4	0.53
26	1 39.7	15 58 31.50	-21 20 31.4	6.2	6.0	0.43	11	2 42.4	20 2 43.87	-22 36 26.1	7.6	7.4	0.53
27	1 40.9	16 3 40.13	21 37 45.9	6.2	6.1	0.43	12	2 43.6	20 7 50.66	22 21 25.5	7.7	7.5	0.53
28	1 42.1	16 8 49.92	21 54 24.9	6.2	6.1	0.44	13	2 44.7	20 12 56.04	22 5 47.3	7.7	7.5	0.54
29	1 43.4	16 14 0.84	22 10 27.6	6.2	6.1	0.44	14	2 45.8	20 17 59.97	21 49 32.2	7.8	7.6	0.54
30	1 44.6	16 19 12.85	22 25 53.4	6.3	6.2	0.44	15	2 46.9	20 23 2.42	21 32 41.0	7.8	7.6	0.54
31	1 45.9	16 24 25.94	-22 40 41.8	6.3	6.2	0.45	16	2 47.9	20 28 3.35	-21 15 14.3	7.8	7.6	0.54
Nov. 1	1 47.2	16 29 40.08	22 54 51.9	6.3	6.3	0.45	17	2 49.0	20 33 2.73	20 57 12.8	7.9	7.7	0.54
2	1 48.5	16 34 55.24	23 8 23.2	6.3	6.3	0.45	18	2 50.0	20 38 0.54	20 38 37.3	7.9	7.7	0.55
3	1 49.8	16 40 11.38	23 21 15.1	6.4	6.3	0.45	19	2 51.0	20 42 56.75	20 19 28.6	8.0	7.8	0.55
4	1 51.2	16 45 28.46	23 33 27.0	6.4	6.3	0.46	20	2 52.0	20 47 51.34	19 59 47.4	8.0	7.8	0.55
5	1 52.5	16 50 46.43	-23 44 58.5	6.4	6.3	0.46	21	2 52.9	20 52 44.32	-19 39 34.2	8.1	7.8	0.55
6	1 53.9	16 56 5.24	23 55 49.1	6.5	6.3	0.46	22	2 53.8	20 57 35.66	19 18 49.7	8.1	7.9	0.55
7	1 55.3	17 1 24.85	24 5 58.2	6.5	6.3	0.46	23	2 54.7	21 2 25.36	18 57 35.0	8.2	7.9	0.56
8	1 56.7	17 6 45.20	24 15 25.3	6.5	6.4	0.47	24	2 55.6	21 7 13.40	18 35 50.8	8.2	8.0	0.56
9	1 58.1	17 12 6.24	24 24 10.1	6.6	6.4	0.47	25	2 56.4	21 11 59.79	18 13 37.8	8.3	8.0	0.56
10	1 59.5	17 17 27.90	-24 32 12.1	6.6	6.4	0.47	26	2 57.2	21 16 44.52	-17 50 56.8	8.3	8.1	0.57
11	2 0.9	17 22 50.12	24 39 31.1	6.6	6.4	0.47	27	2 58.0	21 21 27.61	17 27 48.5	8.4	8.1	0.57
12	2 2.3	17 28 12.84	24 46 6.5	6.6	6.4	0.47	28	2 58.7	21 26 9.04	17 4 13.6	8.4	8.2	0.57
13	2 3.8	17 33 35.98	24 51 58.0	6.7	6.5	0.47	29	2 59.4	21 30 48.83	16 40 13.1	8.5	8.2	0.57
14	2 5.2	17 38 59.49	24 57 5.4	6.7	6.5	0.48	30	3 0.1	21 35 26.99	16 15 47.6	8.5	8.3	0.58
15	2 6.6	17 44 23.30	-25 1 28.3	6.7	6.5	0.48	31	3 0.8	21 40 3.51	-15 50 58.1	8.6	8.4	0.58
16	2 8.0	17 49 47.34	-25 5 6.7	6.7	6.6	0.48	32	3 1.4	21 44 38.40	-15 25 45.3	8.6	8.4	0.58

## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid. T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
July 1	19 0.0	1 40 26.31	+ 9 5 5.3	1.7	18.2	1.30	Aug. 16	16 13.1	1 54 26.67	+10 12 17.6	2.0	21.0	1.52
2	18 56.6	1 40 58.02	9 7 53.6	1.7	18.3	1.31	17	16 9.2	1 54 28.78	10 12 13.6	2.0	21.1	1.53
3	18 53.2	1 41 29.24	9 10 38.7	1.7	18.3	1.31	18	16 5.3	1 54 30.13	10 12 5.5	2.0	21.1	1.53
4	18 49.8	1 41 59.96	9 13 20.6	1.7	18.4	1.32	19	16 1.4	1 54 30.73	10 11 53.3	2.0	21.2	1.53
5	18 46.4	1 42 30.16	9 15 59.2	1.7	18.4	1.32	20	15 57.5	1 54 30.58	10 11 36.9	2.0	21.3	1.54
6	18 42.9	1 42 59.83	+ 9 18 34.5	1.7	18.5	1.33	21	15 53.5	1 54 29.68	+10 11 16.4	2.0	21.4	1.54
7	18 39.5	1 43 28.98	9 21 6.5	1.7	18.5	1.33	22	15 49.6	1 54 28.02	10 10 51.9	2.0	21.4	1.55
8	18 36.0	1 43 57.60	9 23 35.1	1.7	18.6	1.34	23	15 45.6	1 54 25.60	10 10 23.3	2.0	21.5	1.55
9	18 32.6	1 44 25.67	9 26 0.3	1.8	18.6	1.34	24	15 41.6	1 54 22.42	10 9 50.7	2.0	21.6	1.56
10	18 29.1	1 44 53.19	9 28 22.1	1.8	18.7	1.35	25	15 37.6	1 54 18.49	10 9 14.1	2.0	21.6	1.57
11	18 25.6	1 45 20.15	+ 9 30 40.5	1.8	18.7	1.35	26	15 33.6	1 54 13.81	+10 8 33.4	2.0	21.7	1.57
12	18 22.1	1 45 46.55	9 32 55.4	1.8	18.8	1.36	27	15 29.6	1 54 8.38	10 7 48.6	2.0	21.8	1.58
13	18 18.6	1 46 12.37	9 35 6.8	1.8	18.9	1.36	28	15 25.6	1 54 2.20	10 6 59.8	2.0	21.8	1.53
14	18 15.1	1 46 37.61	9 37 14.7	1.8	18.9	1.37	29	15 21.5	1 53 55.27	10 6 7.0	2.0	21.9	1.58
15	18 11.6	1 47 2.28	9 39 19.0	1.8	19.0	1.37	30	15 17.4	1 53 47.59	10 5 10.2	2.1	22.0	1.59
16	18 8.0	1 47 26.35	+ 9 41 19.7	1.8	19.1	1.37	31	15 13.4	1 53 39.16	+10 4 9.5	2.1	22.1	1.59
17	18 4.5	1 47 49.81	9 43 16.8	1.8	19.1	1.38	Sept. 1	15 9.3	1 53 29.99	10 3 4.7	2.1	22.1	1.60
18	18 0.9	1 48 12.68	9 45 10.3	1.8	19.2	1.38	2	15 5.2	1 53 20.08	10 1 56.0	2.1	22.2	1.60
19	17 57.4	1 48 34.94	9 47 0.2	1.8	19.3	1.39	3	15 1.1	1 53 9.43	10 0 43.4	2.1	22.2	1.60
20	17 53.8	1 48 56.58	9 48 46.5	1.8	19.3	1.39	4	14 57.0	1 52 58.05	9 59 27.0	2.1	22.3	1.61
21	17 50.2	1 49 17.59	+ 9 50 29.0	1.8	19.4	1.39	5	14 52.8	1 52 45.93	+ 9 58 6.6	2.1	22.4	1.61
22	17 46.6	1 49 37.98	9 52 7.8	1.8	19.5	1.40	6	14 48.7	1 52 33.10	9 56 42.4	2.1	22.4	1.61
23	17 43.0	1 49 57.74	9 53 42.9	1.8	19.5	1.40	7	14 44.5	1 52 19.55	9 55 14.4	2.1	22.5	1.62
24	17 39.4	1 50 16.86	9 55 14.3	1.8	19.6	1.41	8	14 40.4	1 52 5.29	9 53 42.7	2.1	22.5	1.62
25	17 35.8	1 50 35.33	9 56 42.0	1.8	19.7	1.41	9	14 36.2	1 51 50.33	9 52 7.3	2.1	22.6	1.62
26	17 32.2	1 50 53.16	+ 9 58 5.9	1.8	19.7	1.42	10	14 32.0	1 51 34.68	+ 9 50 28.2	2.1	22.6	1.63
27	17 28.5	1 51 10.34	9 59 25.9	1.8	19.8	1.43	11	14 27.8	1 51 18.35	9 48 45.6	2.1	22.7	1.63
28	17 24.9	1 51 26.85	10 0 42.1	1.8	19.8	1.43	12	14 23.6	1 51 1.35	9 46 59.4	2.1	22.7	1.63
29	17 21.2	1 51 42.68	10 1 54.5	1.9	19.9	1.44	13	14 19.3	1 50 43.70	9 45 9.7	2.1	22.8	1.64
30	17 17.5	1 51 57.83	10 3 3.0	1.9	20.0	1.44	14	14 15.1	1 50 25.40	9 43 16.6	2.1	22.8	1.64
31	17 13.8	1 52 12.31	+10 4 7.6	1.9	20.0	1.45	15	14 10.9	1 50 6.46	+ 9 41 20.2	2.1	22.9	1.64
Aug. 1	17 10.1	1 52 26.10	10 5 8.3	1.9	20.1	1.45	16	14 6.0	1 49 46.90	9 39 20.6	2.1	22.9	1.65
2	17 6.4	1 52 39.19	10 6 5.1	1.9	20.1	1.46	17	14 2.3	1 49 26.72	9 37 17.7	2.1	23.0	1.65
3	17 2.7	1 52 51.59	10 6 58.0	1.9	20.2	1.46	18	13 58.0	1 49 5.95	9 35 11.7	2.2	23.0	1.66
4	16 58.9	1 53 3.28	10 7 46.9	1.9	20.3	1.47	19	13 53.7	1 48 44.60	9 33 2.6	2.2	23.1	1.66
5	16 55.2	1 53 14.27	+10 8 31.7	1.9	20.3	1.47	20	13 49.4	1 48 22.68	+ 9 30 50.5	2.2	23.1	1.66
6	16 51.4	1 53 24.52	10 9 12.5	1.9	20.4	1.48	21	13 45.1	1 48 0.21	9 28 35.5	2.2	23.2	1.67
7	16 47.6	1 53 34.05	10 9 49.3	1.9	20.4	1.48	22	13 40.8	1 47 37.19	9 26 17.7	2.2	23.2	1.67
8	16 43.8	1 53 42.85	10 10 22.1	1.9	20.5	1.49	23	13 36.1	1 47 13.65	9 23 57.1	2.2	23.2	1.67
9	16 40.1	1 53 50.93	10 10 50.8	1.9	20.6	1.49	24	13 32.2	1 46 49.59	9 21 33.9	2.2	23.3	1.67
10	16 36.3	1 53 58.27	+10 11 15.4	1.9	20.6	1.50	25	13 27.8	1 46 25.03	+ 9 19 8.1	2.2	23.3	1.68
11	16 32.4	1 54 4.86	10 11 36.0	1.9	20.7	1.50	26	13 23.5	1 45 59.99	9 16 39.8	2.2	23.3	1.68
12	16 28.6	1 54 10.72	10 11 52.5	1.9	20.8	1.51	27	13 19.1	1 45 34.49	9 14 9.1	2.2	23.4	1.68
13	16 24.8	1 54 15.83	10 12 4.9	1.9	20.8	1.51	28	13 14.8	1 45 8.55	9 11 36.2	2.2	23.4	1.68
14	16 20.9	1 54 20.20	10 12 13.2	2.0	20.9	1.51	29	13 10.4	1 44 42.17	9 9 1.0	2.2	23.5	1.69
15	16 17.0	1 54 23.81	+10 12 17.4	2.0	20.9	1.52	30	13 6.0	1 44 15.38	+ 9 6 23.8	2.2	23.5	1.69
16	16 13.1	1 54 26.67	+10 12 17.6	2.0	21.0	1.52	Oct. 1	13 1.6	1 43 48.20	+ 9 3 44.6	2.2	23.5	1.69

## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid. T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Oct. 1	13 1.6	1 43 48.20	+9 3 44.6	2.2	23.5	1.69	Nov. 16	9 39.3	1 22 14.58	+7 2 29.0	2.2	23.0	1.64
2	12 57.2	1 43 20.63	9 1 3.6	2.2	23.5	1.69	17	9 35.0	1 21 53.72	7 0 39.7	2.2	22.9	1.64
3	12 52.9	1 42 52.71	8 58 20.8	2.2	23.6	1.69	18	9 30.8	1 21 33.45	6 58 54.3	2.1	22.9	1.63
4	12 48.5	1 42 24.45	8 55 36.2	2.2	23.6	1.70	19	9 26.5	1 21 13.81	6 57 12.8	2.1	22.8	1.63
5	12 44.0	1 41 55.87	8 52 50.1	2.2	23.6	1.70	20	9 22.3	1 20 54.80	6 55 35.3	2.1	22.8	1.62
6	12 39.6	1 41 27.01	+8 50 2.6	2.2	23.7	1.70	21	9 18.0	1 20 36.43	+6 54 1.8	2.1	22.7	1.62
7	12 35.2	1 40 57.88	8 47 13.8	2.2	23.7	1.70	22	9 13.8	1 20 18.72	6 52 32.5	2.1	22.7	1.62
8	12 30.8	1 40 28.49	8 44 23.8	2.2	23.7	1.70	23	9 9.6	1 20 1.67	6 51 7.4	2.1	22.6	1.62
9	12 26.4	1 39 58.88	8 41 32.8	2.2	23.7	1.70	24	9 5.4	1 19 45.30	6 49 46.5	2.1	22.6	1.61
10	12 22.0	1 39 29.07	8 38 40.9	2.2	23.7	1.70	25	9 1.2	1 19 29.61	6 48 29.9	2.1	22.5	1.61
11	12 17.5	1 38 59.10	+8 35 48.4	2.2	23.7	1.70	26	8 57.0	1 19 14.60	+6 47 17.6	2.1	22.4	1.60
12	12 13.1	1 38 28.97	8 32 55.1	2.2	23.8	1.71	27	8 52.8	1 19 0.29	6 46 9.7	2.1	22.3	1.60
13	12 8.7	1 37 58.70	8 30 1.3	2.2	23.8	1.71	28	8 48.7	1 18 46.68	6 45 6.1	2.1	22.3	1.59
14	12 4.2	1 37 28.33	8 27 7.2	2.2	23.8	1.71	29	8 44.5	1 18 33.79	6 44 7.0	2.1	22.2	1.59
15	11 59.8	1 36 57.88	8 24 12.9	2.2	23.8	1.71	30	8 40.4	1 18 21.62	6 43 12.4	2.1	22.1	1.58
16	11 55.3	1 36 27.36	+8 21 18.5	2.2	23.8	1.71	Dec. 1	8 36.3	1 18 10.19	+6 42 22.4	2.1	22.1	1.58
17	11 50.9	1 35 56.81	8 18 24.2	2.2	23.8	1.71	2	8 32.2	1 17 59.50	6 41 36.9	2.1	22.0	1.57
18	11 46.4	1 35 26.26	8 15 30.0	2.2	23.8	1.71	3	8 28.1	1 17 49.55	6 40 56.1	2.1	22.0	1.57
19	11 42.0	1 34 55.73	8 12 36.0	2.2	23.8	1.71	4	8 24.0	1 17 40.35	6 40 20.0	2.1	21.9	1.57
20	11 37.6	1 34 25.23	8 9 42.5	2.2	23.8	1.71	5	8 19.9	1 17 31.91	6 39 48.6	2.1	21.9	1.56
21	11 33.2	1 33 54.77	+8 6 49.7	2.2	23.7	1.70	6	8 15.8	1 17 24.21	+6 39 21.7	2.1	21.8	1.56
22	11 28.7	1 33 24.41	8 3 57.8	2.2	23.7	1.70	7	8 11.8	1 17 17.29	6 38 59.6	2.0	21.7	1.56
23	11 24.3	1 32 54.15	8 1 6.7	2.2	23.7	1.70	8	8 7.8	1 17 11.15	6 38 42.3	2.0	21.7	1.55
24	11 19.9	1 32 24.01	7 58 16.5	2.2	23.7	1.70	9	8 3.7	1 17 5.78	6 38 29.7	2.0	21.6	1.55
25	11 15.4	1 31 54.02	7 55 27.4	2.2	23.7	1.70	10	7 59.7	1 17 1.18	6 38 21.9	2.0	21.5	1.54
26	11 11.0	1 31 24.20	+7 52 39.6	2.2	23.7	1.70	11	7 55.7	1 16 57.38	+6 38 18.8	2.0	21.5	1.54
27	11 6.6	1 30 54.56	7 49 53.3	2.2	23.7	1.70	12	7 51.7	1 16 54.35	6 38 20.5	2.0	21.4	1.54
28	11 2.2	1 30 25.13	7 47 8.3	2.2	23.6	1.69	13	7 47.8	1 16 52.10	6 38 26.9	2.0	21.3	1.53
29	10 57.7	1 29 55.94	7 44 25.0	2.2	23.6	1.69	14	7 43.8	1 16 50.62	6 38 38.1	2.0	21.3	1.53
30	10 53.3	1 29 27.01	7 41 43.6	2.2	23.6	1.69	15	7 39.9	1 16 49.92	6 38 54.1	2.0	21.2	1.52
31	10 48.9	1 28 58.35	+7 39 4.1	2.2	23.6	1.69	16	7 35.9	1 16 49.99	+6 39 14.8	2.0	21.1	1.52
Nov. 1	10 44.5	1 28 29.99	7 36 26.6	2.2	23.6	1.69	17	7 32.0	1 16 50.85	6 39 40.2	2.0	21.1	1.51
2	10 40.1	1 28 1.95	7 33 51.2	2.2	23.6	1.69	18	7 28.1	1 16 52.49	6 40 10.3	2.0	21.0	1.51
3	10 35.7	1 27 34.25	7 31 18.0	2.2	23.5	1.68	19	7 24.2	1 16 54.91	6 40 45.2	2.0	20.9	1.50
4	10 31.3	1 27 6.91	7 28 47.3	2.2	23.5	1.68	20	7 20.4	1 16 58.08	6 41 24.7	2.0	20.9	1.50
5	10 27.0	1 26 39.96	+7 26 19.1	2.2	23.5	1.68	21	7 16.5	1 17 2.02	+6 42 8.7	2.0	20.8	1.49
6	10 22.6	1 26 13.42	7 23 53.5	2.2	23.5	1.68	22	7 12.6	1 17 6.73	6 42 57.3	1.9	20.7	1.49
7	10 18.2	1 25 47.30	7 21 30.7	2.2	23.4	1.67	23	7 8.8	1 17 12.19	6 43 50.6	1.9	20.7	1.48
8	10 13.9	1 25 21.64	7 19 10.9	2.2	23.4	1.67	24	7 5.0	1 17 18.41	6 44 48.4	1.9	20.6	1.48
9	10 9.5	1 24 56.45	7 16 54.1	2.2	23.3	1.67	25	7 1.2	1 17 25.39	6 45 50.7	1.9	20.5	1.47
10	10 5.2	1 24 31.74	+7 14 40.3	2.2	23.3	1.66	26	6 57.4	1 17 33.13	+6 46 57.6	1.9	20.4	1.47
11	10 0.9	1 24 7.53	7 12 29.8	2.2	23.2	1.66	27	6 53.6	1 17 41.61	6 48 9.0	1.9	20.4	1.46
12	9 56.5	1 23 43.83	7 10 22.7	2.2	23.2	1.66	28	6 49.8	1 17 50.84	6 49 24.8	1.9	20.3	1.46
13	9 52.2	1 23 20.67	7 8 19.0	2.2	23.1	1.65	29	6 46.0	1 18 0.82	6 50 44.9	1.9	20.3	1.45
14	9 47.9	1 22 58.07	7 6 18.8	2.2	23.1	1.65	30	6 42.3	1 18 11.54	6 52 9.4	1.9	20.2	1.44
15	9 43.6	1 22 36.04	+7 4 22.1	2.2	23.0	1.65	31	6 38.5	1 18 23.00	+6 53 38.4	1.9	20.1	1.44
16	9 39.3	1 22 14.58	+7 2 29.0	2.2	23.0	1.64	32	6 34.8	1 18 35.19	+6 55 11.6	1.9	20.1	1.43

## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid. T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
May 13	18 6.8	21 33 51.58	-15 28 30.8	0.9	7.9	0.58	June 27	15 8.7	21 32 40.35	-15 42 25.2	1.0	8.5	0.63
14	18 3.0	21 33 58.30	15 28 8.8	0.9	8.0	0.58	28	15 4.6	21 32 30.50	15 43 23.1	1.0	8.5	0.63
15	17 59.1	21 34 4.64	15 27 48.7	0.9	8.0	0.59	29	15 0.5	21 32 20.33	15 44 22.5	1.0	8.6	0.63
16	17 55.3	21 34 10.61	15 27 30.5	0.9	8.0	0.59	30	14 56.4	21 32 9.84	15 45 23.4	1.0	8.6	0.63
17	17 51.5	21 34 16.19	15 27 14.0	0.9	8.0	0.59	July 1	14 52.3	21 31 59.05	15 46 25.6	1.0	8.6	0.64
18	17 47.6	21 34 21.39	-15 26 59.4	0.9	8.0	0.59	2	14 48.1	21 31 47.95	-15 47 29.1	1.0	8.6	0.64
19	17 43.8	21 34 26.22	15 26 46.8	0.9	8.0	0.59	3	14 44.0	21 31 36.54	15 48 34.0	1.0	8.6	0.64
20	17 39.9	21 34 30.66	15 26 36.1	0.9	8.0	0.59	4	14 39.9	21 31 24.84	15 49 40.2	1.0	8.6	0.64
21	17 36.0	21 34 34.72	15 26 27.2	0.9	8.0	0.59	5	14 35.7	21 31 12.87	15 50 47.6	1.0	8.6	0.64
22	17 32.2	21 34 38.40	15 26 20.1	0.9	8.1	0.59	6	14 31.6	21 31 0.61	15 51 56.2	1.0	8.6	0.64
23	17 28.3	21 34 41.70	-15 26 14.9	0.9	8.1	0.60	7	14 27.5	21 30 48.06	-15 53 6.1	1.0	8.6	0.64
24	17 24.4	21 34 44.61	15 26 11.6	0.9	8.1	0.60	8	14 23.3	21 30 35.23	15 54 17.2	1.0	8.7	0.64
25	17 20.5	21 34 47.15	15 26 10.2	0.9	8.1	0.60	9	14 19.2	21 30 22.15	15 55 29.4	1.0	8.7	0.64
26	17 16.6	21 34 49.31	15 26 10.7	0.9	8.1	0.60	10	14 15.0	21 30 8.81	15 56 42.7	1.0	8.7	0.64
27	17 12.7	21 34 51.08	15 26 13.0	0.9	8.1	0.60	11	14 10.9	21 29 55.20	15 57 57.0	1.0	8.7	0.64
28	17 8.8	21 34 52.47	-15 26 17.2	0.9	8.1	0.60	12	14 6.7	21 29 41.34	-15 59 12.3	1.0	8.7	0.64
29	17 4.9	21 34 53.48	15 26 23.4	0.9	8.1	0.60	13	14 2.5	21 29 27.25	16 0 28.6	1.0	8.7	0.64
30	17 1.0	21 34 54.11	15 26 31.4	0.9	8.1	0.60	14	13 58.4	21 29 12.92	16 1 45.9	1.0	8.7	0.64
31	16 57.0	21 34 54.36	15 26 41.2	0.9	8.2	0.61	15	13 54.2	21 28 58.36	16 3 4.1	1.0	8.7	0.64
June 1	16 53.1	21 34 54.24	15 26 52.9	0.9	8.2	0.61	16	13 50.0	21 28 43.58	16 4 23.0	1.0	8.7	0.65
2	16 49.2	21 34 53.73	-15 27 6.5	0.9	8.2	0.61	17	13 45.8	21 28 28.59	-16 5 42.8	1.0	8.7	0.65
3	16 45.2	21 34 52.84	15 27 21.9	0.9	8.2	0.61	18	13 41.7	21 28 13.40	16 7 3.4	1.0	8.7	0.65
4	16 41.3	21 34 51.57	15 27 39.2	0.9	8.2	0.61	19	13 37.5	21 27 58.01	16 8 24.9	1.0	8.7	0.65
5	16 37.3	21 34 49.92	15 27 58.4	0.9	8.2	0.61	20	13 33.3	21 27 42.43	16 9 47.0	1.0	8.7	0.65
6	16 33.4	21 34 47.88	15 28 19.3	0.9	8.3	0.61	21	13 29.1	21 27 26.67	16 11 9.7	1.0	8.7	0.65
7	16 29.4	21 34 45.45	-15 28 42.1	0.9	8.3	0.61	22	13 24.9	21 27 10.75	-16 12 33.1	1.0	8.7	0.65
8	16 25.4	21 34 42.64	15 29 6.9	0.9	8.3	0.62	23	13 20.7	21 26 54.65	16 13 57.1	1.0	8.7	0.65
9	16 21.4	21 34 39.46	15 29 33.5	0.9	8.3	0.62	24	13 16.5	21 26 38.39	16 15 21.6	1.0	8.8	0.65
10	16 17.4	21 34 35.91	15 30 1.8	0.9	8.3	0.62	25	13 12.3	21 26 21.99	16 16 46.5	1.0	8.8	0.65
11	16 13.4	21 34 31.98	15 30 31.9	0.9	8.3	0.62	26	13 8.1	21 26 5.44	16 18 12.0	1.0	8.8	0.65
12	16 9.4	21 34 27.68	-15 31 3.8	0.9	8.3	0.62	27	13 3.9	21 25 48.75	-16 19 37.9	1.0	8.8	0.65
13	16 5.4	21 34 23.01	15 31 37.5	0.9	8.4	0.62	28	12 59.7	21 25 31.93	16 21 4.2	1.0	8.8	0.65
14	16 1.4	21 34 17.97	15 32 13.0	0.9	8.4	0.62	29	12 55.4	21 25 15.00	16 22 30.8	1.0	8.8	0.65
15	15 57.4	21 34 12.57	15 32 50.2	0.9	8.4	0.62	30	12 51.2	21 24 57.90	16 23 57.6	1.0	8.8	0.65
16	15 53.4	21 34 6.80	15 33 29.1	0.9	8.4	0.62	31	12 47.0	21 24 40.82	16 25 24.7	1.0	8.8	0.65
17	15 49.3	21 34 0.67	-15 34 9.7	0.9	8.4	0.63	Aug. 1	12 42.8	21 24 23.58	-16 26 52.0	1.0	8.8	0.65
18	15 45.3	21 33 54.18	15 34 52.1	1.0	8.4	0.63	2	12 38.6	21 24 6.26	16 28 19.4	1.0	8.8	0.65
19	15 41.2	21 33 47.35	15 35 36.1	1.0	8.4	0.63	3	12 34.3	21 23 48.86	16 29 46.9	1.0	8.8	0.65
20	15 37.2	21 33 40.17	15 36 21.8	1.0	8.4	0.63	4	12 30.1	21 23 31.38	16 31 14.6	1.0	8.8	0.65
21	15 33.1	21 33 32.63	15 37 9.0	1.0	8.5	0.63	5	12 25.9	21 23 13.84	16 32 42.3	1.0	8.8	0.65
22	15 29.1	21 33 24.75	-15 37 57.8	1.0	8.5	0.63	6	12 21.7	21 22 56.25	-16 34 10.0	1.0	8.8	0.65
23	15 25.0	21 33 16.53	15 38 48.3	1.0	8.5	0.63	7	12 17.5	21 22 38.62	16 35 37.6	1.0	8.8	0.65
24	15 20.9	21 33 7.98	15 39 40.2	1.0	8.5	0.63	8	12 13.2	21 22 20.06	16 37 5.1	1.0	8.8	0.65
25	15 16.8	21 32 59.09	15 40 33.7	1.0	8.5	0.63	9	12 9.0	21 22 3.27	16 38 32.5	1.0	8.8	0.65
26	15 12.8	21 32 49.88	15 41 28.7	1.0	8.5	0.63	10	12 4.8	21 21 45.57	16 39 59.6	1.0	8.8	0.65
27	15 8.7	21 32 40.35	-15 42 25.2	1.0	8.5	0.63	11	12 0.6	21 21 27.87	-16 41 26.5	1.0	8.8	0.65
28	15 4.6	21 32 30.50	15 43 23.1	1.0	8.5	0.63	12	11 56.3	21 21 10.17	16 42 53.1	1.0	8.8	0.65

## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid. T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Aug. 12	11 56.3	21 21 10.17	-16 42 53.1	1.0	8.8	0.65	Sept. 27	8 44.5	21 10 11.62	-17 33 29.3	1.0	8.5	0.64
13	11 52.1	21 20 52.48	16 44 19.4	1.0	8.8	0.65	28	8 40.5	21 10 3.52	17 34 3.6	1.0	8.5	0.63
14	11 47.9	21 20 34.82	16 45 45.3	1.0	8.8	0.65	29	8 36.4	21 9 55.76	17 34 36.2	1.0	8.5	0.63
15	11 43.6	21 20 17.20	16 47 10.8	1.0	8.8	0.65	30	8 32.4	21 9 48.37	17 35 7.1	0.9	8.5	0.63
16	11 39.4	21 19 59.63	16 48 35.9	1.0	8.8	0.65	Oct. 1	8 28.3	21 9 41.34	17 35 36.2	0.9	8.5	0.63
17	11 35.2	21 19 42.10	-16 50 0.5	1.0	8.8	0.65	2	8 24.3	21 9 34.68	-17 36 3.7	0.9	8.5	0.63
18	11 31.0	21 19 24.64	16 51 24.6	1.0	8.8	0.65	3	8 20.2	21 9 28.39	17 36 29.5	0.9	8.4	0.63
19	11 26.8	21 19 7.25	16 52 48.0	1.0	8.8	0.65	4	8 16.2	21 9 22.48	17 36 53.6	0.9	8.4	0.63
20	11 22.6	21 18 49.03	16 54 10.8	1.0	8.8	0.65	5	8 12.2	21 9 16.95	17 37 15.9	0.9	8.4	0.63
21	11 18.3	21 18 32.71	16 55 32.9	1.0	8.8	0.65	6	8 8.2	21 9 11.80	17 37 36.4	0.9	8.4	0.63
22	11 14.1	21 18 15.59	-16 56 54.4	1.0	8.8	0.65	7	8 4.1	21 9 7.03	-17 37 55.0	0.9	8.4	0.63
23	11 9.9	21 17 58.57	16 58 15.2	1.0	8.8	0.65	8	8 0.1	21 9 2.65	17 38 12.0	0.9	8.4	0.63
24	11 5.7	21 17 41.66	16 59 35.2	1.0	8.8	0.65	9	7 56.1	21 8 58.67	17 38 27.2	0.9	8.4	0.63
25	11 1.5	21 17 24.88	17 0 54.3	1.0	8.8	0.65	10	7 52.2	21 8 55.08	17 38 40.6	0.9	8.4	0.63
26	10 57.3	21 17 8.23	17 2 12.7	1.0	8.8	0.65	11	7 48.2	21 8 51.89	17 38 52.2	0.9	8.3	0.62
27	10 53.0	21 16 51.72	-17 3 30.2	1.0	8.8	0.65	12	7 44.2	21 8 49.10	-17 39 2.0	0.9	8.3	0.62
28	10 48.8	21 16 35.35	17 4 46.8	1.0	8.8	0.65	13	7 40.2	21 8 46.72	17 39 10.0	0.9	8.3	0.62
29	10 44.6	21 16 19.14	17 6 2.5	1.0	8.7	0.65	14	7 36.3	21 8 44.75	17 39 16.1	0.9	8.3	0.62
30	10 40.4	21 16 3.10	17 7 17.1	1.0	8.7	0.65	15	7 32.3	21 8 43.17	17 39 20.5	0.9	8.3	0.62
31	10 36.2	21 15 47.23	17 8 30.6	1.0	8.7	0.65	16	7 28.3	21 8 42.00	17 39 23.0	0.9	8.3	0.62
Sept. 1	10 32.1	21 15 31.53	-17 9 43.2	1.0	8.7	0.65	17	7 24.4	21 8 41.24	-17 39 23.8	0.9	8.3	0.62
2	10 27.9	21 15 16.01	17 10 54.8	1.0	8.7	0.65	18	7 20.5	21 8 40.88	17 39 22.8	0.9	8.3	0.62
3	10 23.7	21 15 0.70	17 12 5.2	1.0	8.7	0.65	19	7 16.5	21 8 40.92	17 39 20.0	0.9	8.2	0.62
4	10 19.5	21 14 45.60	17 13 14.4	1.0	8.7	0.65	20	7 12.6	21 8 41.37	17 39 15.4	0.9	8.2	0.62
5	10 15.3	21 14 30.70	17 14 22.4	1.0	8.7	0.65	21	7 8.7	21 8 42.23	17 39 9.0	0.9	8.2	0.61
6	10 11.2	21 14 16.02	-17 15 29.3	1.0	8.7	0.65	22	7 4.8	21 8 43.50	-17 39 0.7	0.9	8.2	0.61
7	10 7.0	21 14 1.58	17 16 35.0	1.0	8.7	0.65	23	7 0.9	21 8 45.16	17 38 50.6	0.9	8.2	0.61
8	10 2.8	21 13 47.37	17 17 39.4	1.0	8.7	0.65	24	6 57.0	21 8 47.23	17 38 38.7	0.9	8.2	0.61
9	9 58.7	21 13 33.41	17 18 42.5	1.0	8.7	0.65	25	6 53.1	21 8 49.71	17 38 25.1	0.9	8.1	0.61
10	9 54.5	21 13 19.70	17 19 44.2	1.0	8.7	0.65	26	6 49.2	21 8 52.60	17 38 9.6	0.9	8.1	0.61
11	9 50.3	21 13 6.26	-17 20 44.5	1.0	8.6	0.65	27	6 45.3	21 8 55.90	-17 37 52.3	0.9	8.1	0.61
12	9 46.2	21 12 53.08	17 21 43.6	1.0	8.6	0.65	28	6 41.4	21 8 59.59	17 37 33.3	0.9	8.1	0.61
13	9 42.0	21 12 40.17	17 22 41.3	1.0	8.6	0.65	29	6 37.6	21 9 3.69	17 37 12.5	0.9	8.1	0.60
14	9 37.9	21 12 27.55	17 23 37.5	1.0	8.6	0.65	30	6 33.7	21 9 8.20	17 36 49.9	0.9	8.1	0.60
15	9 33.8	21 12 15.21	17 24 32.2	1.0	8.6	0.65	31	6 29.9	21 9 13.11	17 36 25.5	0.9	8.1	0.60
16	9 29.6	21 12 3.17	-17 25 25.4	1.0	8.6	0.65	Nov. 1	6 26.0	21 9 18.43	-17 35 59.3	0.9	8.0	0.60
17	9 25.5	21 11 51.43	17 26 17.2	1.0	8.6	0.64	2	6 22.2	21 9 24.15	17 35 31.3	0.9	8.0	0.60
18	9 21.4	21 11 39.99	17 27 7.6	1.0	8.6	0.64	3	6 18.4	21 9 30.26	17 35 1.6	0.9	8.0	0.60
19	9 17.3	21 11 28.87	17 27 56.4	1.0	8.6	0.64	4	6 14.5	21 9 36.78	17 34 30.0	0.9	8.0	0.60
20	9 13.1	21 11 18.06	17 28 43.6	1.0	8.6	0.64	5	6 10.7	21 9 43.70	17 33 56.6	0.9	8.0	0.60
21	9 9.0	21 11 7.57	-17 29 29.1	1.0	8.6	0.64	6	6 6.9	21 9 51.02	-17 33 21.5	0.9	8.0	0.59
22	9 4.9	21 10 57.40	17 30 13.1	1.0	8.5	0.64	7	6 3.1	21 9 58.74	17 32 44.7	0.9	7.9	0.59
23	9 0.8	21 10 47.57	17 30 55.5	1.0	8.5	0.64	8	5 59.3	21 10 6.85	17 32 6.3	0.9	7.9	0.59
24	8 56.8	21 10 38.07	17 31 36.4	1.0	8.5	0.64	9	5 55.5	21 10 15.36	17 31 26.1	0.9	7.9	0.59
25	8 52.7	21 10 28.90	17 32 15.7	1.0	8.5	0.64	10	5 51.7	21 10 24.26	17 30 44.0	0.9	7.9	0.59
26	8 48.6	21 10 20.08	-17 32 53.3	1.0	8.5	0.64	11	5 48.0	21 10 33.55	-17 30 0.2	0.9	7.9	0.59
27	8 44.5	21 10 11.62	17 33 29.3	1.0	8.5	0.64	12	5 44.2	21 10 43.22	-17 29 14.8	0.9	7.8	0.59

## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid.T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid.T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Mar. 18	18 13.0	17 59 19.74	-23 37 37.9	0.5	1.7	0.13	May 3	15 11.0	17 58 11.27	-23 38 26.1	0.5	1.8	0.13
19	18 9.2	17 59 23.22	23 37 39.1	0.5	1.7	0.13	4	15 7.0	17 58 4.97	23 38 26.8	0.5	1.8	0.13
20	18 5.3	17 59 26.48	23 37 40.3	0.5	1.7	0.13	5	15 3.0	17 57 58.50	23 38 27.5	0.5	1.8	0.13
21	18 1.4	17 59 29.51	23 37 41.4	0.5	1.7	0.13	6	14 58.9	17 57 51.85	23 38 28.2	0.5	1.8	0.13
22	17 57.5	17 59 32.32	23 37 42.5	0.5	1.7	0.13	7	14 54.9	17 57 45.04	23 38 28.8	0.5	1.8	0.13
23	17 53.6	17 59 34.69	23 37 43.7	0.5	1.7	0.13	8	14 50.8	17 57 38.05	23 38 29.4	0.5	1.8	0.13
24	17 49.7	17 59 37.24	23 37 44.8	0.5	1.7	0.13	9	14 46.8	17 57 30.91	23 38 29.9	0.5	1.8	0.13
25	17 45.8	17 59 39.36	23 37 45.9	0.5	1.7	0.13	10	14 42.7	17 57 23.61	23 38 30.4	0.5	1.8	0.13
26	17 41.9	17 59 41.27	23 37 47.1	0.5	1.7	0.13	11	14 38.6	17 57 16.15	23 38 30.9	0.5	1.8	0.13
27	17 38.0	17 59 42.95	23 37 48.2	0.5	1.8	0.13	12	14 34.6	17 57 8.53	23 38 31.4	0.5	1.8	0.13
28	17 34.1	17 59 44.40	23 37 49.3	0.5	1.8	0.13	13	14 30.5	17 57 0.76	23 38 31.8	0.5	1.8	0.13
29	17 30.2	17 59 45.62	23 37 50.4	0.5	1.8	0.13	14	14 26.5	17 56 52.85	23 38 32.2	0.5	1.8	0.13
30	17 26.3	17 59 46.62	23 37 51.6	0.5	1.8	0.13	15	14 22.4	17 56 44.79	23 38 32.5	0.5	1.8	0.13
31	17 22.4	17 59 47.39	23 37 52.7	0.5	1.8	0.13	16	14 18.3	17 56 36.59	23 38 32.8	0.5	1.8	0.13
Apr. 1	17 18.4	17 59 47.94	23 37 53.8	0.5	1.8	0.13	17	14 14.3	17 56 28.25	23 38 33.0	0.5	1.8	0.13
2	17 14.5	17 59 48.26	23 37 54.9	0.5	1.8	0.13	18	14 10.2	17 56 19.78	23 38 33.2	0.5	1.8	0.13
3	17 10.6	17 59 48.35	23 37 56.1	0.5	1.8	0.13	19	14 6.1	17 56 11.18	23 38 33.3	0.5	1.8	0.13
4	17 6.7	17 59 48.23	23 37 57.2	0.5	1.8	0.13	20	14 2.0	17 56 2.44	23 38 33.4	0.5	1.8	0.13
5	17 2.7	17 59 47.88	23 37 58.3	0.5	1.8	0.13	21	13 58.0	17 55 53.59	23 38 33.4	0.5	1.8	0.13
6	16 58.8	17 59 47.31	23 37 59.4	0.5	1.8	0.13	22	13 53.9	17 55 44.63	23 38 33.4	0.5	1.8	0.13
7	16 54.8	17 59 46.51	23 38 0.5	0.5	1.8	0.13	23	13 49.8	17 55 35.55	23 38 33.3	0.5	1.8	0.13
8	16 50.9	17 59 45.49	23 38 1.6	0.5	1.8	0.13	24	13 45.7	17 55 26.36	23 38 33.2	0.5	1.8	0.13
9	16 46.9	17 59 44.24	23 38 2.7	0.5	1.8	0.13	25	13 41.6	17 55 17.05	23 38 33.0	0.5	1.8	0.13
10	16 43.0	17 59 42.77	23 38 3.8	0.5	1.8	0.13	26	13 37.5	17 55 7.65	23 38 32.7	0.5	1.8	0.13
11	16 39.0	17 59 41.08	23 38 4.9	0.5	1.8	0.13	27	13 33.4	17 54 58.15	23 38 32.4	0.5	1.8	0.13
12	16 35.0	17 59 39.18	23 38 6.0	0.5	1.8	0.13	28	13 29.3	17 54 48.56	23 38 32.0	0.5	1.8	0.13
13	16 31.1	17 59 37.06	23 38 7.1	0.5	1.8	0.13	29	13 25.2	17 54 38.87	23 38 31.5	0.5	1.8	0.13
14	16 27.1	17 59 34.72	23 38 8.2	0.5	1.8	0.13	30	13 21.2	17 54 29.10	23 38 31.0	0.5	1.8	0.13
15	16 23.1	17 59 32.17	23 38 9.3	0.5	1.8	0.13	31	13 17.1	17 54 19.25	23 38 30.5	0.5	1.8	0.13
16	16 19.2	17 59 29.40	23 38 10.4	0.5	1.8	0.13	June 1	13 13.0	17 54 9.32	23 38 29.9	0.5	1.8	0.13
17	16 15.2	17 59 26.41	23 38 11.5	0.5	1.8	0.13	2	13 8.9	17 53 59.31	23 38 29.3	0.5	1.8	0.13
18	16 11.2	17 59 23.20	23 38 12.5	0.5	1.8	0.13	3	13 4.8	17 53 49.23	23 38 28.6	0.5	1.8	0.13
19	16 7.2	17 59 19.79	23 38 13.5	0.5	1.8	0.13	4	13 0.7	17 53 39.07	23 38 27.8	0.5	1.8	0.13
20	16 3.2	17 59 16.17	23 38 14.5	0.5	1.8	0.13	5	12 56.6	17 53 28.84	23 38 27.0	0.5	1.8	0.13
21	15 59.2	17 59 12.34	23 38 15.5	0.5	1.8	0.13	6	12 52.5	17 53 18.56	23 38 26.1	0.5	1.8	0.13
22	15 55.2	17 59 8.32	23 38 16.5	0.5	1.8	0.13	7	12 48.3	17 53 8.22	23 38 25.1	0.5	1.8	0.13
23	15 51.2	17 59 4.10	23 38 17.5	0.5	1.8	0.13	8	12 44.2	17 52 57.83	23 38 24.1	0.5	1.8	0.13
24	15 47.2	17 58 59.68	23 38 18.5	0.5	1.8	0.13	9	12 40.1	17 52 47.40	23 38 23.0	0.5	1.8	0.13
25	15 43.2	17 58 55.06	23 38 19.4	0.5	1.8	0.13	10	12 36.0	17 52 36.92	23 38 21.8	0.5	1.8	0.13
26	15 39.2	17 58 50.24	23 38 20.3	0.5	1.8	0.13	11	12 31.9	17 52 26.41	23 38 20.6	0.5	1.8	0.13
27	15 35.2	17 58 45.23	23 38 21.2	0.5	1.8	0.13	12	12 27.8	17 52 15.87	23 38 19.3	0.5	1.8	0.13
28	15 31.2	17 58 40.03	23 38 22.1	0.5	1.8	0.13	13	12 23.7	17 52 5.29	23 38 18.0	0.5	1.8	0.13
29	15 27.2	17 58 34.64	23 38 22.9	0.5	1.8	0.13	14	12 19.6	17 51 54.69	23 38 16.6	0.5	1.8	0.13
30	15 23.1	17 58 29.07	23 38 23.7	0.5	1.8	0.13	15	12 15.5	17 51 44.07	23 38 15.2	0.5	1.8	0.13
May 1	15 19.1	17 58 23.31	23 38 24.5	0.5	1.8	0.13	16	12 11.4	17 51 33.43	23 38 13.7	0.5	1.8	0.13
2	15 15.1	17 58 17.38	23 38 25.3	0.5	1.8	0.13	17	12 7.3	17 51 22.78	23 38 12.1	0.5	1.8	0.13
3	15 11.0	17 58 11.27	23 38 26.1	0.5	1.8	0.13	18	12 3.2	17 51 12.13	23 38 10.5	0.5	1.8	0.13



## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.
	h m s	h m s	° ' "	"	"	s		h m s	h m s	° ' "	"	"	s
June 18	12 3.2	17 51 12.13	-23 38 10.5	0.5	1.8	0.13	Aug. 3	8 55.3	17 44 7.59	-23 36 21.1	0.5	1.8	0.13
19	11 59.1	17 51 1.48	23 38 8.8	0.5	1.8	0.13	4	8 51.3	17 44 1.21	23 36 18.8	0.5	1.8	0.13
20	11 55.0	17 50 50.83	23 38 7.1	0.5	1.8	0.13	5	8 47.2	17 43 55.00	23 36 16.5	0.5	1.8	0.13
21	11 50.8	17 50 40.18	23 38 5.3	0.5	1.8	0.13	6	8 43.2	17 43 48.97	23 36 14.3	0.5	1.8	0.13
22	11 46.7	17 50 29.55	23 38 3.5	0.5	1.8	0.13	7	8 39.1	17 43 43.12	23 36 12.1	0.5	1.8	0.13
23	11 42.6	17 50 18.93	-23 38 1.6	0.5	1.8	0.13	8	8 35.1	17 43 37.45	-23 36 9.9	0.5	1.8	0.13
24	11 38.5	17 50 8.33	23 37 59.6	0.5	1.8	0.13	9	8 31.1	17 43 31.96	23 36 7.8	0.5	1.8	0.13
25	11 34.4	17 49 57.76	23 37 57.6	0.5	1.8	0.13	10	8 27.1	17 43 26.66	23 36 5.7	0.5	1.8	0.13
26	11 30.3	17 49 47.21	23 37 55.6	0.5	1.8	0.13	11	8 23.0	17 43 21.55	23 36 3.7	0.5	1.8	0.13
27	11 26.2	17 49 36.70	23 37 53.5	0.5	1.8	0.13	12	8 19.0	17 43 16.63	23 36 1.8	0.5	1.8	0.13
28	11 22.1	17 49 26.23	-23 37 51.4	0.5	1.8	0.13	13	8 15.0	17 43 11.91	-23 35 59.9	0.5	1.8	0.13
29	11 18.0	17 49 15.81	23 37 49.2	0.5	1.8	0.13	14	8 11.0	17 43 7.39	23 35 58.1	0.5	1.8	0.13
30	11 13.9	17 49 5.42	23 37 47.0	0.5	1.8	0.13	15	8 7.0	17 43 3.06	23 35 56.4	0.5	1.8	0.13
July 1	11 9.8	17 48 55.08	23 37 44.7	0.5	1.8	0.13	16	8 3.0	17 42 58.92	23 35 54.8	0.5	1.8	0.13
2	11 5.7	17 48 44.79	23 37 42.4	0.5	1.8	0.13	17	7 59.0	17 42 54.99	23 35 53.2	0.5	1.8	0.13
3	11 1.6	17 48 34.56	-23 37 40.1	0.5	1.8	0.13	18	7 55.0	17 42 51.26	-23 35 51.6	0.5	1.8	0.13
4	10 57.5	17 48 24.39	23 37 37.7	0.5	1.8	0.13	19	7 51.0	17 42 47.74	23 35 50.2	0.5	1.8	0.13
5	10 53.4	17 48 14.29	23 37 35.3	0.5	1.8	0.13	20	7 47.0	17 42 44.42	23 35 48.9	0.5	1.8	0.13
6	10 49.3	17 48 4.26	23 37 32.8	0.5	1.8	0.13	21	7 43.1	17 42 41.31	23 35 47.6	0.5	1.8	0.13
7	10 45.2	17 47 54.30	23 37 30.3	0.5	1.8	0.13	22	7 39.1	17 42 38.41	23 35 46.4	0.5	1.8	0.13
8	10 41.1	17 47 44.41	-23 37 27.8	0.5	1.8	0.13	23	7 35.1	17 42 35.71	-23 35 45.3	0.5	1.8	0.13
9	10 37.0	17 47 34.60	23 37 25.3	0.5	1.8	0.13	24	7 31.1	17 42 33.22	23 35 44.2	0.5	1.8	0.13
10	10 32.9	17 47 24.88	23 37 22.8	0.5	1.8	0.13	25	7 27.2	17 42 30.94	23 35 43.2	0.5	1.8	0.13
11	10 28.8	17 47 15.26	23 37 20.2	0.5	1.8	0.13	26	7 23.2	17 42 28.88	23 35 42.2	0.5	1.8	0.13
12	10 24.7	17 47 5.74	23 37 17.6	0.5	1.8	0.13	27	7 19.2	17 42 27.03	23 35 41.4	0.5	1.8	0.13
13	10 20.6	17 46 56.32	-23 37 15.0	0.5	1.8	0.13	28	7 15.3	17 42 25.39	-23 35 40.7	0.5	1.8	0.13
14	10 16.6	17 46 47.00	23 37 12.4	0.5	1.8	0.13	29	7 11.3	17 42 23.97	23 35 40.1	0.5	1.8	0.13
15	10 12.5	17 46 37.78	23 37 9.8	0.5	1.8	0.13	30	7 7.4	17 42 22.77	23 35 39.6	0.5	1.8	0.13
16	10 8.4	17 46 28.67	23 37 7.2	0.5	1.8	0.13	31	7 3.4	17 42 21.78	23 35 39.1	0.5	1.8	0.13
17	10 4.3	17 46 19.68	23 37 4.5	0.5	1.8	0.13	Sept. 1	6 59.5	17 42 21.00	23 35 38.7	0.5	1.8	0.13
18	10 0.2	17 46 10.80	-23 37 1.8	0.5	1.8	0.13	2	6 55.5	17 42 20.45	-23 35 38.4	0.5	1.8	0.13
19	9 56.1	17 46 2.05	23 36 59.2	0.5	1.8	0.13	3	6 51.6	17 42 20.12	23 35 38.2	0.5	1.8	0.13
20	9 52.1	17 45 53.43	23 36 56.5	0.5	1.8	0.13	4	6 47.7	17 42 20.01	23 35 38.0	0.5	1.8	0.13
21	9 48.0	17 45 44.94	23 36 53.8	0.5	1.8	0.13	5	6 43.7	17 42 20.12	23 35 38.0	0.5	1.8	0.13
22	9 43.9	17 45 36.57	23 36 51.2	0.5	1.8	0.13	6	6 39.8	17 42 20.46	23 35 38.1	0.5	1.8	0.13
23	9 39.9	17 45 28.34	-23 36 48.6	0.5	1.8	0.13	7	6 35.9	17 42 21.02	-23 35 38.2	0.5	1.8	0.13
24	9 35.8	17 45 20.25	23 36 46.0	0.5	1.8	0.13	8	6 32.0	17 42 21.80	23 35 38.4	0.5	1.8	0.13
25	9 31.7	17 45 12.29	23 36 43.4	0.5	1.8	0.13	9	6 28.0	17 42 22.80	23 35 38.7	0.5	1.8	0.13
26	9 27.7	17 45 4.48	23 36 40.8	0.5	1.8	0.13	10	6 24.1	17 42 24.04	23 35 39.1	0.5	1.8	0.13
27	9 23.6	17 44 56.82	23 36 38.3	0.5	1.8	0.13	11	6 20.2	17 42 25.50	23 35 39.6	0.5	1.8	0.13
28	9 19.6	17 44 49.31	-23 36 35.8	0.5	1.8	0.13	12	6 16.3	17 42 27.19	-23 35 40.2	0.5	1.8	0.13
29	9 15.5	17 44 41.96	23 36 33.3	0.5	1.8	0.13	13	6 12.4	17 42 29.10	23 35 40.9	0.5	1.7	0.13
30	9 11.4	17 44 34.76	23 36 30.8	0.5	1.8	0.13	14	6 8.5	17 42 31.24	23 35 41.7	0.5	1.7	0.13
31	9 7.4	17 44 27.72	23 36 28.3	0.5	1.8	0.13	15	6 4.6	17 42 33.60	23 35 42.6	0.5	1.7	0.13
Aug. 1	9 3.4	17 44 20.84	23 36 25.9	0.5	1.8	0.13	16	6 0.8	17 42 36.19	23 35 43.6	0.5	1.7	0.13
2	8 59.3	17 44 14.13	-23 36 23.5	0.5	1.8	0.13	17	5 56.9	17 42 39.00	-23 35 44.6	0.5	1.7	0.13
3	8 55.3	17 44 7.59	23 36 21.1	0.5	1.8	0.13	18	5 53.0	17 42 42.04	-23 35 45.7	0.5	1.7	0.13

## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Jan. 0	11 41.3	6 19 4.80	+22 17 26.4	0.3	1.3	0.10	Feb. 15	8 35.9	6 14 28.79	+22 20 33.4	0.3	1.3	0.09
1	11 37.3	6 18 57.52	22 17 30.5	0.3	1.3	0.10	16	8 31.9	6 14 25.01	22 20 37.1	0.3	1.3	0.09
2	11 33.2	6 18 50.25	22 17 34.7	0.3	1.3	0.10	17	8 27.9	6 14 21.35	22 20 40.7	0.3	1.3	0.09
3	11 29.2	6 18 43.00	22 17 38.8	0.3	1.3	0.10	18	8 23.9	6 14 17.82	22 20 44.3	0.3	1.3	0.09
4	11 25.1	6 18 35.77	22 17 43.0	0.3	1.3	0.10	19	8 20.0	6 14 14.42	22 20 47.9	0.3	1.3	0.09
5	11 21.1	6 18 28.57	+22 17 47.1	0.3	1.3	0.10	20	8 16.0	6 14 11.16	+22 20 51.5	0.3	1.3	0.09
6	11 17.0	6 18 21.40	22 17 51.3	0.3	1.3	0.10	21	8 12.0	6 14 8.03	22 20 55.0	0.3	1.3	0.09
7	11 13.0	6 18 14.26	22 17 55.4	0.3	1.3	0.10	22	8 8.0	6 14 5.03	22 20 58.5	0.3	1.3	0.09
8	11 8.9	6 18 7.15	22 17 59.6	0.3	1.3	0.10	23	8 4.0	6 14 2.17	22 21 1.9	0.3	1.3	0.09
9	11 4.9	6 18 0.06	22 18 3.8	0.3	1.3	0.10	24	8 0.0	6 13 59.45	22 21 5.3	0.3	1.3	0.09
10	11 0.8	6 17 53.02	+22 18 8.0	0.3	1.3	0.10	25	7 56.1	6 13 56.86	+22 21 8.7	0.3	1.3	0.09
11	10 56.8	6 17 46.03	22 18 12.2	0.3	1.3	0.10	26	7 52.1	6 13 54.40	22 21 12.1	0.3	1.3	0.09
12	10 52.7	6 17 39.09	22 18 16.4	0.3	1.3	0.10	27	7 48.1	6 13 52.08	22 21 15.5	0.3	1.3	0.09
13	10 48.7	6 17 32.19	22 18 20.6	0.3	1.3	0.10	28	7 44.2	6 13 49.90	22 21 18.8	0.3	1.3	0.09
14	10 44.6	6 17 25.34	22 18 24.8	0.3	1.3	0.10	29	7 40.2	6 13 47.86	22 21 22.1	0.3	1.3	0.09
15	10 40.6	6 17 18.55	+22 18 29.0	0.3	1.3	0.10	Mar. 1	7 36.2	6 13 45.96	+22 21 25.3	0.3	1.3	0.09
16	10 36.6	6 17 11.81	22 18 33.2	0.3	1.3	0.10	2	7 32.3	6 13 44.21	22 21 28.5	0.3	1.3	0.09
17	10 32.5	6 17 5.14	22 18 37.4	0.3	1.3	0.10	3	7 28.4	6 13 42.60	22 21 31.7	0.3	1.3	0.09
18	10 28.5	6 16 58.53	22 18 41.6	0.3	1.3	0.10	4	7 24.4	6 13 41.13	22 21 34.8	0.3	1.3	0.09
19	10 24.4	6 16 51.98	22 18 45.8	0.3	1.3	0.10	5	7 20.4	6 13 39.79	22 21 37.9	0.3	1.3	0.09
20	10 20.4	6 16 45.51	+22 18 50.0	0.3	1.3	0.10	6	7 16.4	6 13 38.59	+22 21 40.9	0.3	1.3	0.09
21	10 16.4	6 16 39.10	22 18 54.2	0.3	1.3	0.10	7	7 12.5	6 13 37.54	22 21 43.9	0.3	1.3	0.09
22	10 12.3	6 16 32.77	22 18 58.4	0.3	1.3	0.10	8	7 8.5	6 13 36.64	22 21 46.9	0.3	1.3	0.09
23	10 8.3	6 16 26.52	22 19 2.5	0.3	1.3	0.10	9	7 4.6	6 13 35.88	22 21 49.8	0.3	1.3	0.09
24	10 4.3	6 16 20.35	22 19 6.6	0.3	1.3	0.10	10	7 0.7	6 13 35.27	22 21 52.6	0.3	1.3	0.09
25	10 0.2	6 16 14.25	+22 19 10.7	0.3	1.3	0.10	11	6 56.7	6 13 34.81	+22 21 55.4	0.3	1.3	0.09
26	9 56.2	6 16 8.24	22 19 14.8	0.3	1.3	0.10	12	6 52.8	6 13 34.50	22 21 58.2	0.3	1.3	0.09
27	9 52.2	6 16 2.31	22 19 18.9	0.3	1.3	0.10	13	6 48.8	6 13 34.33	22 22 0.9	0.3	1.3	0.09
28	9 48.1	6 15 56.47	22 19 23.0	0.3	1.3	0.10	14	6 44.9	6 13 34.31	22 22 3.6	0.3	1.3	0.09
29	9 44.1	6 15 50.71	22 19 27.1	0.3	1.3	0.10	15	6 41.0	6 13 34.43	22 22 6.2	0.3	1.3	0.09
30	9 40.1	6 15 45.05	+22 19 31.2	0.3	1.3	0.10	16	6 37.1	6 13 34.70	+22 22 8.8	0.3	1.3	0.09
31	9 36.1	6 15 39.49	22 19 35.2	0.3	1.3	0.10	17	6 33.1	6 13 35.11	22 22 11.4	0.3	1.3	0.09
Feb. 1	9 32.0	6 15 34.03	22 19 39.2	0.3	1.3	0.10	18	6 29.2	6 13 35.67	22 22 13.9	0.3	1.3	0.09
2	9 28.0	6 15 28.67	22 19 43.2	0.3	1.3	0.10	19	6 25.3	6 13 36.38	22 22 16.4	0.3	1.3	0.09
3	9 24.0	6 15 23.40	22 19 47.2	0.3	1.3	0.10	20	6 21.4	6 13 37.24	22 22 18.8	0.3	1.3	0.09
4	9 20.0	6 15 18.23	+22 19 51.2	0.3	1.3	0.10	21	6 17.5	6 13 38.25	+22 22 21.2	0.3	1.3	0.09
5	9 15.9	6 15 13.17	22 19 55.2	0.3	1.3	0.10	22	6 13.6	6 13 39.40	22 22 23.5	0.3	1.3	0.09
6	9 11.9	6 15 8.22	22 19 59.1	0.3	1.3	0.10	23	6 9.6	6 13 40.70	22 22 25.8	0.3	1.3	0.09
7	9 7.9	6 15 3.38	22 20 3.0	0.3	1.3	0.10	24	6 5.7	6 13 42.15	22 22 28.0	0.3	1.3	0.09
8	9 3.9	6 14 58.65	22 20 6.9	0.3	1.3	0.09	25	6 1.8	6 13 43.75	22 22 30.1	0.3	1.3	0.09
9	8 59.9	6 14 54.04	+22 20 10.8	0.3	1.3	0.09	Sept. 25	18 15.7	6 35 5.42	+22 11 47.5	0.3	1.3	0.09
10	8 55.9	6 14 49.54	22 20 14.6	0.3	1.3	0.09	26	18 11.8	6 35 7.55	22 11 44.3	0.3	1.3	0.09
11	8 51.9	6 14 45.15	22 20 18.4	0.3	1.3	0.09	27	18 7.9	6 35 9.54	22 11 41.1	0.3	1.3	0.09
12	8 47.9	6 14 40.88	22 20 22.2	0.3	1.3	0.09	28	18 4.0	6 35 11.39	22 11 38.0	0.3	1.3	0.09
13	8 43.9	6 14 36.72	22 20 26.0	0.3	1.3	0.09	29	18 0.1	6 35 13.10	22 11 35.0	0.3	1.3	0.09
14	8 39.9	6 14 32.69	+22 20 29.7	0.3	1.3	0.09	30	17 56.2	6 35 14.66	+22 11 32.1	0.3	1.3	0.09
15	8 35.9	6 14 28.79	+22 20 33.4	0.3	1.3	0.09	Oct. 1	17 52.3	6 35 16.07	+22 11 29.3	0.3	1.3	0.09

## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid.T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid.T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Oct. 1	17 52.3	6 35 16.07	+22 11 29.3	0.3	1.3	0.09	Nov. 16	14 50.0	6 33 48.71	+22 11 40.5	0.3	1.3	0.09
2	17 48.4	6 35 17.34	22 11 26.7	0.3	1.3	0.09	17	14 46.0	6 33 43.79	22 11 43.6	0.3	1.3	0.09
3	17 44.5	6 35 18.47	22 11 24.3	0.3	1.3	0.09	18	14 42.0	6 33 38.76	22 11 46.8	0.3	1.3	0.09
4	17 40.6	6 35 19.45	22 11 22.0	0.3	1.3	0.09	19	14 38.0	6 33 33.62	22 11 50.1	0.3	1.3	0.09
5	17 36.7	6 35 20.28	22 11 19.8	0.3	1.3	0.09	20	14 33.9	6 33 28.38	22 11 53.4	0.3	1.3	0.10
6	17 32.7	6 35 20.97	+22 11 17.6	0.3	1.3	0.09	21	14 29.9	6 33 23.04	+22 11 56.8	0.3	1.3	0.10
7	17 28.8	6 35 21.52	22 11 15.6	0.3	1.3	0.09	22	14 25.9	6 33 17.61	22 12 0.4	0.3	1.3	0.10
8	17 24.9	6 35 21.92	22 11 13.8	0.3	1.3	0.09	23	14 21.9	6 33 12.08	22 12 4.1	0.3	1.3	0.10
9	17 21.0	6 35 22.18	22 11 12.1	0.3	1.3	0.09	24	14 17.8	6 33 6.45	22 12 7.9	0.3	1.3	0.10
10	17 17.0	6 35 22.29	22 11 10.4	0.3	1.3	0.09	25	14 13.8	6 33 0.73	22 12 11.8	0.3	1.3	0.10
11	17 13.1	6 35 22.26	+22 11 8.9	0.3	1.3	0.09	26	14 9.8	6 32 54.93	+22 12 15.8	0.3	1.3	0.10
12	17 9.2	6 35 22.07	22 11 7.6	0.3	1.3	0.09	27	14 5.8	6 32 49.03	22 12 19.9	0.3	1.3	0.10
13	17 5.2	6 35 21.74	22 11 6.4	0.3	1.3	0.09	28	14 1.7	6 32 43.03	22 12 24.1	0.3	1.3	0.10
14	17 1.3	6 35 21.27	22 11 5.3	0.3	1.3	0.09	29	13 57.7	6 32 36.96	22 12 28.4	0.3	1.3	0.10
15	16 57.4	6 35 20.65	22 11 4.3	0.3	1.3	0.09	30	13 53.7	6 32 30.81	22 12 32.7	0.3	1.3	0.10
16	16 53.4	6 35 19.88	+22 11 3.5	0.3	1.3	0.09	Dec. 1	13 49.7	6 32 24.59	+22 12 37.0	0.3	1.3	0.10
17	16 49.5	6 35 18.98	22 11 2.8	0.3	1.3	0.09	2	13 45.6	6 32 18.28	22 12 41.4	0.3	1.3	0.10
18	16 45.5	6 35 17.94	22 11 2.2	0.3	1.3	0.09	3	13 41.5	6 32 11.91	22 12 45.9	0.3	1.3	0.10
19	16 41.6	6 35 16.76	22 11 1.7	0.3	1.3	0.09	4	13 37.5	6 32 5.46	22 12 50.5	0.3	1.3	0.10
20	16 37.6	6 35 15.42	22 11 1.4	0.3	1.3	0.09	5	13 33.5	6 31 58.94	22 12 55.2	0.3	1.3	0.10
21	16 33.7	6 35 13.95	+22 11 1.2	0.3	1.3	0.09	6	13 29.4	6 31 52.34	+22 13 0.1	0.3	1.3	0.10
22	16 29.7	6 35 12.34	22 11 1.1	0.3	1.3	0.09	7	13 25.4	6 31 45.69	22 13 5.0	0.3	1.3	0.10
23	16 25.7	6 35 10.58	22 11 1.1	0.3	1.3	0.09	8	13 21.4	6 31 38.98	22 13 9.9	0.3	1.3	0.10
24	16 21.8	6 35 8.69	22 11 1.3	0.3	1.3	0.09	9	13 17.3	6 31 32.21	22 13 14.9	0.3	1.3	0.10
25	16 17.8	6 35 6.66	22 11 1.6	0.3	1.3	0.09	10	13 13.3	6 31 25.38	22 13 19.9	0.3	1.3	0.10
26	16 13.8	6 35 4.49	+22 11 2.1	0.3	1.3	0.09	11	13 9.2	6 31 18.51	+22 13 25.0	0.3	1.3	0.10
27	16 9.9	6 35 2.17	22 11 2.7	0.3	1.3	0.09	12	13 5.2	6 31 11.59	22 13 30.1	0.3	1.3	0.10
28	16 5.9	6 34 59.72	22 11 3.4	0.3	1.3	0.09	13	13 1.1	6 31 4.62	22 13 35.3	0.3	1.3	0.10
29	16 1.9	6 34 57.13	22 11 4.2	0.3	1.3	0.09	14	12 57.1	6 30 57.59	22 13 40.6	0.3	1.3	0.10
30	15 57.9	6 34 54.41	22 11 5.2	0.3	1.3	0.09	15	12 53.0	6 30 50.54	22 13 45.9	0.3	1.3	0.10
31	15 54.0	6 34 51.56	+22 11 6.4	0.3	1.3	0.09	16	12 49.0	6 30 43.46	+22 13 51.2	0.3	1.3	0.10
Nov. 1	15 50.0	6 34 48.58	22 11 7.7	0.3	1.3	0.09	17	12 44.9	6 30 36.34	22 13 56.6	0.3	1.3	0.10
2	15 46.0	6 34 45.47	22 11 9.1	0.3	1.3	0.09	18	12 40.9	6 30 29.18	22 14 2.0	0.3	1.3	0.10
3	15 42.0	6 34 42.23	22 11 10.5	0.3	1.3	0.09	19	12 36.8	6 30 22.00	22 14 7.5	0.3	1.3	0.10
4	15 38.0	6 34 38.86	22 11 12.0	0.3	1.3	0.09	20	12 32.8	6 30 14.80	22 14 13.0	0.3	1.3	0.10
5	15 34.0	6 34 35.35	+22 11 13.6	0.3	1.3	0.09	21	12 28.7	6 30 7.56	+22 14 18.5	0.3	1.3	0.10
6	15 30.0	6 34 31.72	22 11 15.4	0.3	1.3	0.09	22	12 24.7	6 30 0.30	22 14 24.1	0.3	1.3	0.10
7	15 26.0	6 34 27.96	22 11 17.4	0.3	1.3	0.09	23	12 20.6	6 29 53.03	22 14 29.7	0.3	1.3	0.10
8	15 22.0	6 34 24.07	22 11 19.5	0.3	1.3	0.09	24	12 16.6	6 29 45.74	22 14 35.3	0.3	1.3	0.10
9	15 18.0	6 34 20.06	22 11 21.7	0.3	1.3	0.09	25	12 12.5	6 29 38.44	22 14 41.0	0.3	1.3	0.10
10	15 14.0	6 34 15.93	+22 11 24.0	0.3	1.3	0.09	26	12 8.5	6 29 31.13	+22 14 46.7	0.3	1.3	0.10
11	15 10.0	6 34 11.68	22 11 26.5	0.3	1.3	0.09	27	12 4.4	6 29 23.81	22 14 52.4	0.3	1.3	0.10
12	15 6.0	6 34 7.32	22 11 29.1	0.3	1.3	0.09	28	12 0.4	6 29 16.49	22 14 58.2	0.3	1.3	0.10
13	15 2.0	6 34 2.87	22 11 31.8	0.3	1.3	0.09	29	11 56.3	6 29 9.18	22 15 4.0	0.3	1.3	0.10
14	14 58.0	6 33 58.24	22 11 34.6	0.3	1.3	0.09	30	11 52.2	6 29 1.87	22 15 9.8	0.3	1.3	0.10
15	14 54.0	6 33 53.53	+22 11 37.5	0.3	1.3	0.09	31	11 48.2	6 28 54.56	+22 15 15.6	0.3	1.3	0.10
16	14 50.0	6 33 48.71	+22 11 40.5	0.3	1.3	0.09	32	11 44.1	6 28 47.27	+22 15 21.4	0.3	1.3	0.10



PART III

---

P H E N O M E N A



## ECLIPSES IN 1904.

In the year 1904 there will be two eclipses, both of the Sun.

I.—*An Annular Eclipse of the Sun, 1904, March 16, invisible at Washington.*

## ELEMENTS OF THE ECLIPSE.

Greenwich mean time of $\delta$ in right ascension, March 16				<sup>d</sup> 17	<sup>h</sup> 45	<sup>m</sup> 39.1		
Sun and Moon's R. A.	<sup>h</sup> 23	<sup>m</sup> 46	<sup>s</sup> 8.07	Hourly motions		<sup>s</sup> 9.14 and <sup>m</sup> 54.49		
Sun's declination	<sup>°</sup> 1	<sup>'</sup> 30	<sup>"</sup> 8.6 S.	Hourly motion		<sup>°</sup> 0 59.3	N.	
Moon's declination	<sup>°</sup> 1	<sup>'</sup> 22	<sup>"</sup> 46.6 S.	Hourly motion		<sup>°</sup> 9 21.4	N.	
Sun's equa. hor. parallax	8.8			Sun's true semidiameter		<sup>'</sup> 16 4.1		
Moon's equa. hor. parallax	<sup>'</sup> 54	<sup>"</sup> 24.6		Moon's true semidiameter		<sup>'</sup> 14 49.6		

## CIRCUMSTANCES OF THE ECLIPSE.

	Greenwich Mean Time.			Longitude from Greenwich.		Latitude.	
	<sup>d</sup>	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>	<sup>'</sup>	<sup>°</sup>	<sup>'</sup>
Eclipse begins	March 16	14	36.5	52	41.7 E.	12	58.7 S.
Central eclipse begins		16	15 44.0	35	53.6 E.	10	15.3 S.
Central eclipse at noon		16	17 45.7	95	44.8 E.	6	20.6 N.
Central eclipse ends		16	19 37.6	157	3.7 E.	25	12.4 N.
Eclipse ends		16	20 45.0	140	17.4 E.	22	29.7 N.

II.—*A Total Eclipse of the Sun, 1904, September 9, invisible at Washington.*

## ELEMENTS OF THE ECLIPSE.

Greenwich mean time of $\delta$ in right ascension, September 9				<sup>d</sup> 9	<sup>h</sup> 8	<sup>m</sup> 49	<sup>s</sup> 34.1		
Sun and Moon's R. A.	<sup>h</sup> 11	<sup>m</sup> 11	<sup>s</sup> 5.39	Hourly motions		<sup>s</sup> 9.00 and	<sup>s</sup> 146.16		
Sun's declination	5	14	56.3 N.	Hourly motion		0	56.7	S.	
Moon's declination	5	4	30.7 N.	Hourly motion		11	32.3	S.	
Sun's equa. hor. parallax	8.7			Sun's true semidiameter		15	53.2		
Moon's equa. hor. parallax	61	23.0		Moon's true semidiameter		16	43.6		

## CIRCUMSTANCES OF THE ECLIPSE.

	Greenwich Mean Time.			Longitude from Greenwich.		Latitude.	
	<sup>d</sup>	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>	<sup>'</sup>	<sup>°</sup>	<sup>'</sup>
Eclipse begins	September 9	6	7.8	176	19.0 E.	11	9.3 N.
Central eclipse begins		9	7 3.0	162	49.7 E.	7	53.0 N.
Central eclipse at noon		9	8 49.6	133	5.2 W.	4	35.1 S.
Central eclipse ends		9	10 25.7	69	45.2 W.	26	38.0 S.
Eclipse ends		9	11 20.9	83	11.6 W.	23	21.8 S.

The regions within which the eclipses of the Sun are visible are laid down on the accompanying charts, from which, by means of the dotted lines, the Greenwich times of beginning and ending at any place may be found within fifteen or twenty minutes.

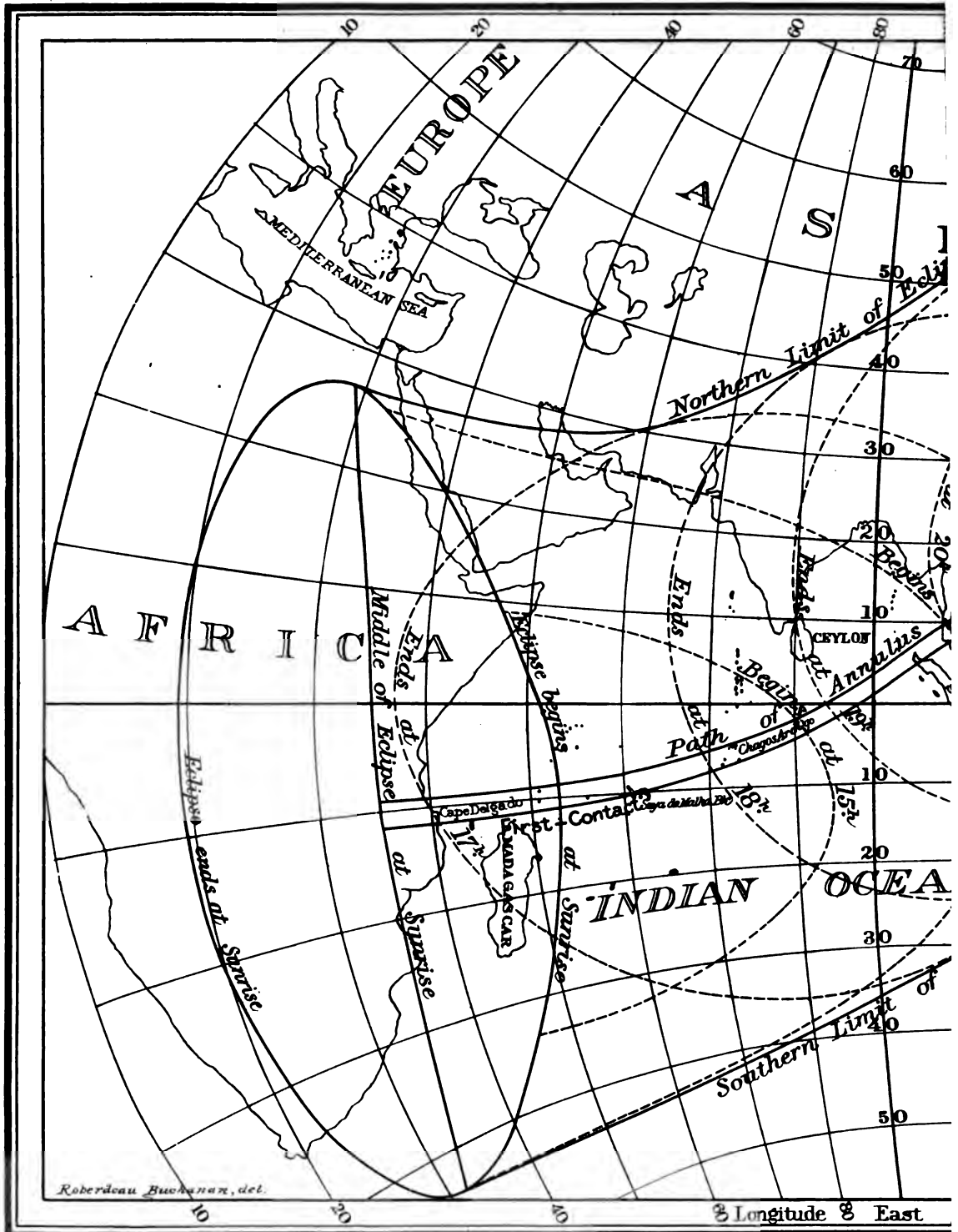
**BESSELIAN ELEMENTS OF THE ANNULAR ECLIPSE  
OF THE SUN, 1904, MARCH 16.**

Greenwich Mean Time.	Co-ordinates of Center of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra and Shadow on Fundamental Plane.	
	<i>x</i>	<i>y</i>	Log sin <i>d</i>	Log cos <i>d</i>	$\mu$	<i>l</i> <sub>1</sub>	<i>l</i> <sub>2</sub>
h m							
14 30	-1.582 10	-0.366 96	-8.433 60	+9.999 84	215 19.6	+0.569 49	+0.022 99
40	1.501 26	0.341 27	8.432 85	9.999 84	217 49.7	0.569 49	0.022 99
50	1.420 42	0.315 58	8.432 10	9.999 84	220 19.7	0.569 49	0.022 99
15 0	-1.339 58	-0.289 89	-8.431 35	+9.999 84	222 49.8	+0.569 49	+0.022 99
10	1.258 73	0.264 20	8.430 60	9.999 84	225 19.8	0.569 48	0.022 98
20	1.177 88	0.238 50	8.429 85	9.999 84	227 49.9	0.569 48	0.022 98
30	1.097 02	0.212 81	8.429 10	9.999 84	230 19.9	0.569 48	0.022 98
40	1.016 16	0.187 11	8.428 34	9.999 84	232 49.9	0.569 47	0.022 97
50	0.935 30	0.161 42	8.427 58	9.999 84	235 20.0	0.569 47	0.022 97
16 0	-0.854 44	-0.135 72	-8.426 82	+9.999 84	237 50.0	+0.569 47	+0.022 97
10	0.773 57	0.110 03	8.426 06	9.999 84	240 20.1	0.569 46	0.022 96
20	0.692 70	0.084 33	8.425 30	9.999 84	242 50.1	0.569 46	0.022 96
30	0.611 83	0.058 64	8.424 54	9.999 84	245 20.1	0.569 45	0.022 95
40	0.530 96	0.032 94	8.423 77	9.999 85	247 50.2	0.569 44	0.022 95
50	0.450 08	-0.007 25	8.423 00	9.999 85	250 20.2	0.569 43	0.022 94
17 0	-0.369 21	+0.018 45	-8.422 23	+9.999 85	252 50.3	+0.569 42	+0.022 93
10	0.288 34	0.044 15	8.421 46	9.999 85	255 20.3	0.569 41	0.022 92
20	0.207 46	0.069 85	8.420 69	9.999 85	257 50.3	0.569 40	0.022 91
30	0.126 59	0.095 55	8.419 92	9.999 85	260 20.4	0.569 39	0.022 90
40	-0.045 71	0.121 25	8.419 15	9.999 85	262 50.4	0.569 38	0.022 89
50	+0.035 17	0.146 95	8.418 37	9.999 85	265 20.5	0.569 37	0.022 88
18 0	+0.116 05	+0.172 66	-8.417 59	+9.999 85	267 50.5	+0.569 36	+0.022 87
10	0.196 93	0.198 36	8.416 81	9.999 85	270 20.6	0.569 34	0.022 86
20	0.277 81	0.224 07	8.416 03	9.999 85	272 50.6	0.569 33	0.022 85
30	0.358 69	0.249 77	8.415 25	9.999 85	275 20.6	0.569 32	0.022 84
40	0.439 56	0.275 48	8.414 47	9.999 85	277 50.7	0.569 31	0.022 82
50	0.520 44	0.301 19	8.413 69	9.999 85	280 20.7	0.569 30	0.022 81
19 0	+0.601 31	+0.326 90	-8.412 90	+9.999 85	282 50.8	+0.569 28	+0.022 79
10	0.682 19	0.352 61	8.412 11	9.999 85	285 20.8	0.569 27	0.022 73
20	0.763 07	0.378 31	8.411 32	9.999 85	287 50.8	0.569 25	0.022 76
30	0.843 95	0.404 02	8.410 53	9.999 85	290 20.9	0.569 23	0.022 74
40	0.924 82	0.429 73	8.409 74	9.999 86	292 50.9	0.569 22	0.022 72
50	1.005 69	0.455 43	8.408 95	9.999 86	295 21.0	0.569 20	0.022 71
20 0	+1.086 56	+0.481 13	-8.408 16	+9.999 86	297 51.0	+0.569 18	+0.022 69
10	1.167 42	0.506 83	8.407 37	9.999 86	300 21.1	0.569 16	0.022 67
20	1.248 28	0.532 53	8.406 58	9.999 86	302 51.1	0.569 14	0.022 65
30	1.329 14	0.558 23	8.405 78	9.999 86	305 21.1	0.569 12	0.022 63
40	1.410 00	0.583 93	8.404 98	9.999 86	307 51.2	0.569 10	0.022 61
50	+1.490 86	+0.609 63	-8.404 18	+9.999 86	310 21.2	+0.569 08	+0.022 59
Greenwich Mean Time.	Log <i>x'</i> for 1 Minute.		Log <i>y'</i> for 1 Minute.		Log $\mu'$ for 1 Minute.	Log Tangents of Angles of Cones.	
						Penumbra.	Shadow.
h m							
14 0	+ 7.9076		+ 7.4097		+ 1.1762	+ 7.671 97	+ 7.669 80
15 0	7.9077		7.4098		1.1762	7.671 96	7.669 79
16 0	7.9078		7.4099		1.1762	7.671 95	7.669 79
17 0	7.9078		7.4099		1.1762	7.671 95	7.669 78
18 0	7.9078		7.4100		1.1762	7.671 95	7.669 78
19 0	7.9078		7.4100		1.1762	7.671 94	7.669 77
20 0	7.9078		7.4100		1.1762	7.671 94	7.669 77
21 0	+ 7.9077		+ 7.4099		+ 1.1762	+ 7.671 93	+ 7.669 76





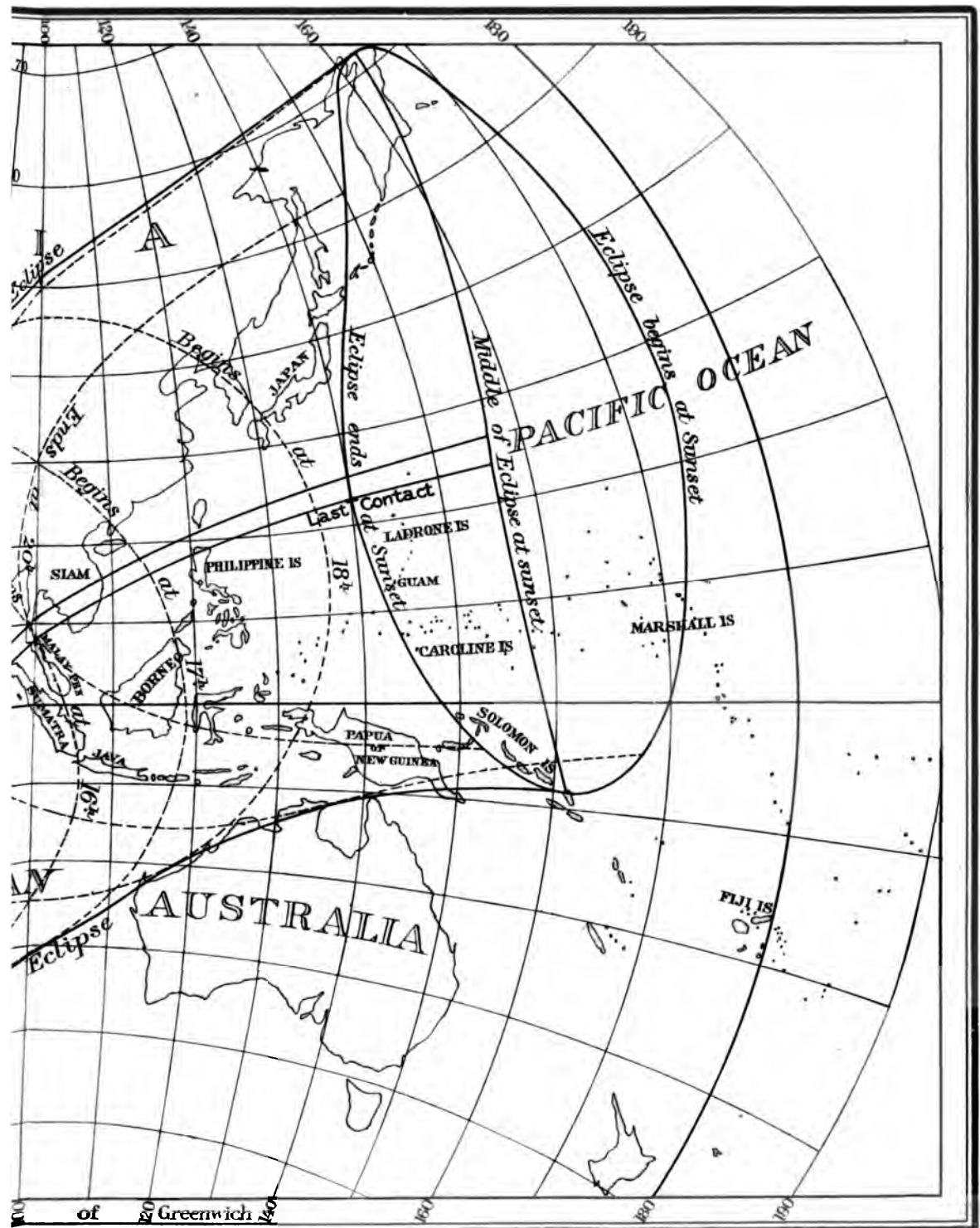
# ANNULAR ECLIPSE



THE MORRIS PETERS CO. PHOTO-LITHO. WASHINGTON D. C.

Note: The hours of beginning and ending

# SE OF MARCH 16<sup>TH</sup> 1904



are expressed in Greenwich Mean Time.



**PATH OF THE ANNULUS DURING THE ANNULAR ECLIPSE  
OF THE SUN, 1904, MARCH 16.**

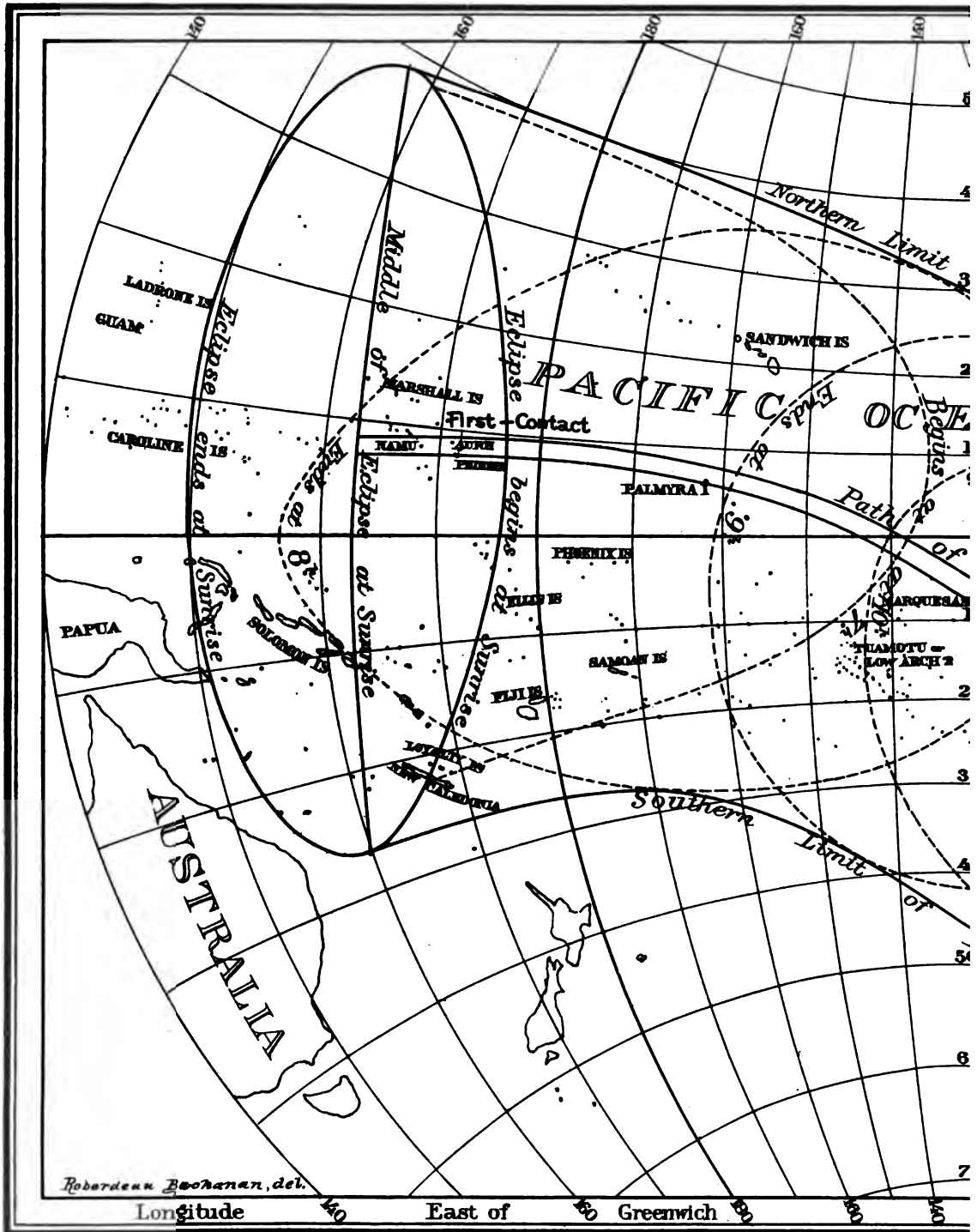
Greenwich Mean Time.	Northern Limit of Annulus Path.		Central Line.		Southern Limit of Annulus Path.		Duration of Annulus on Central Line.
	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	
Limits.	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	m s
15 <sup>h</sup> 50 <sup>m</sup>	- 8 55.1	35 50.8 E.	- 10 15.3	35 53.6 E	- 11 35.4	35 55.8 E.	
55	8 39.0	52 16.2	9 50.5	53 0.7	11 2.0	53 45.2	5 59.9
16 0	8 6.4	57 43.3	9 15.3	58 22.7	10 24.2	59 2.1	6 14.1
5	- 7 31.0	61 45.2	- 8 37.9	62 22.8	- 9 44.8	63 0.4	6 26.1
10	6 53.9	65 1.6	7 59.1	65 38.3	9 4.3	66 15.0	6 36.5
15	6 15.7	67 48.6	7 19.4	68 24.9	8 23.1	69 1.2	6 46.2
20	5 36.8	70 14.1	6 39.1	70 50.3	7 41.4	71 26.5	6 55.1
25	4 57.2	72 25.1	5 58.4	73 1.2	6 59.6	73 37.3	7 3.2
30	4 14.2	74 23.6	5 14.4	74 59.7	6 14.6	75 35.8	7 10.7
35	- 3 36.7	76 11.9	- 4 35.9	76 48.0	- 5 35.1	77 24.1	7 17.7
40	2 55.8	77 52.4	3 54.0	78 28.6	4 52.2	79 4.8	7 24.2
45	2 14.5	79 26.0	3 11.8	80 2.3	4 9.1	80 38.6	7 30.1
50	1 33.0	80 54.3	2 29.5	81 30.6	3 26.0	82 6.9	7 35.5
55	0 51.2	82 17.6	1 47.0	82 54.0	2 42.8	83 30.4	7 40.3
17 0	- 0 9.1	83 37.2	1 4.2	84 13.6	1 59.3	84 50.0	7 44.7
5	+ 0 33.3	84 53.3	- 0 21.2	85 29.7	- 1 15.7	86 6.1	7 48.6
10	1 16.0	86 6.6	+ 0 22.0	86 43.0	- 0 32.0	87 19.4	7 52.0
15	1 58.9	87 17.6	1 5.4	87 54.0	+ 0 11.9	88 30.4	7 55.0
20	2 42.0	88 26.7	1 48.9	89 3.0	0 55.8	89 39.3	7 57.5
25	3 25.5	89 34.3	2 32.7	90 10.5	1 39.9	90 46.7	7 59.5
30	4 9.3	90 40.5	3 16.7	91 16.7	2 24.1	91 52.9	8 1.1
35	+ 4 53.3	91 46.1	+ 4 0.9	92 22.2	+ 3 8.5	92 58.3	8 2.1
40	5 37.6	92 51.1	4 45.3	93 27.1	3 53.0	94 3.1	8 2.4
45	6 22.1	93 55.9	5 29.9	94 31.7	4 37.7	95 7.5	8 2.2
50	7 6.9	95 0.7	6 14.7	95 36.4	5 22.5	96 12.1	8 1.7
55	7 52.1	96 5.9	6 59.8	96 41.4	6 7.5	97 16.9	8 0.7
18 0	8 37.6	97 11.9	7 45.1	97 47.2	6 52.6	98 22.5	7 59.3
5	+ 9 23.4	98 18.8	+ 8 30.7	98 53.8	+ 7 38.0	99 28.8	7 57.5
10	10 9.5	99 27.2	9 16.5	100 1.9	8 23.5	100 36.6	7 55.2
15	10 56.0	100 37.2	10 2.6	101 11.6	9 9.2	101 46.0	7 52.5
20	11 42.8	101 49.3	10 48.9	102 23.4	9 55.0	102 57.5	7 49.3
25	12 30.0	103 4.1	11 35.6	103 37.8	10 41.2	104 11.5	7 45.7
30	13 17.7	104 21.9	12 22.7	104 55.1	11 27.7	105 28.3	7 41.5
35	+ 14 5.7	105 43.4	+ 13 10.0	106 16.0	+ 12 14.3	106 48.6	7 36.8
40	14 54.1	107 9.3	13 57.7	107 41.1	13 1.3	108 12.9	7 31.9
45	15 43.1	108 40.2	14 45.9	109 11.2	13 48.7	109 42.2	7 26.5
50	16 32.6	110 5.8	15 34.5	110 47.0	14 36.4	111 17.2	7 20.5
55	17 22.7	112 0.6	16 23.5	112 29.9	15 24.3	112 59.2	7 14.0
19 0	18 13.4	113 52.3	17 13.1	114 20.5	16 12.8	114 48.7	7 7.1
5	+ 19 4.9	115 55.5	+ 18 3.3	116 22.2	+ 17 1.7	116 48.9	6 59.8
10	19 57.1	118 11.1	18 54.1	118 36.1	17 51.1	119 1.1	6 51.8
15	20 50.2	120 42.4	19 45.7	121 5.3	18 41.2	121 28.2	6 43.2
20	21 44.5	123 35.4	20 38.2	123 55.5	19 31.9	124 15.6	6 34.1
25	22 40.2	126 57.4	21 31.9	127 13.8	20 23.6	127 30.2	6 24.1
30	23 37.5	131 4.1	22 27.0	131 14.6	21 16.5	131 25.1	6 12.8
35	+ 24 38.0	136 25.2	+ 23 24.6	136 27.4	+ 22 11.2	136 29.6	5 59.7
Limits.	25 45.1	144 57.1	24 27.5	144 34.7	23 9.9	144 12.3	5 42.6
	+ 26 31.7	157 6.2 E.	+ 25 12.4	157 3.7 E.	+ 23 53.4	157 0.9 E.	

**BESSELIAN ELEMENTS OF THE TOTAL ECLIPSE  
OF THE SUN, 1904, SEPTEMBER 9.**

Greenwich Mean Time.	Co-ordinates of Center of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra and Shadow on Fundamental Plane.	
	<i>x</i>	<i>y</i>	Log sin <i>d</i>	Log cos <i>d</i>	<i>μ</i>	<i>l</i> <sub>1</sub>	<i>l</i> <sub>2</sub>
h m							
6 0	-1.576 29	+0.318 35	+8.964 94	+9.998 14	90 40.8	+0.532 48	-0.013 84
10	1.483 34	0.289 55	8.964 73	9.998 14	93 10.8	0.532 49	0.013 82
20	1.390 39	0.260 75	8.964 52	9.998 15	95 40.9	0.532 50	0.013 81
30	1.297 44	0.231 95	8.964 31	9.998 15	98 10.9	0.532 51	0.013 80
40	1.204 49	0.203 14	8.964 10	9.998 15	100 41.0	0.532 52	0.013 79
50	1.111 54	0.174 33	8.963 89	9.998 15	103 11.0	0.532 53	0.013 78
7 0	-1.018 58	+0.145 52	+8.963 68	+9.998 15	105 41.1	+0.532 54	-0.013 77
10	0.925 62	0.116 71	8.963 47	9.998 16	108 11.1	0.532 55	0.013 76
20	0.832 66	0.087 89	8.963 26	9.998 16	110 41.2	0.532 56	0.013 75
30	0.739 70	0.059 07	8.963 05	9.998 16	113 11.2	0.532 56	0.013 75
40	0.646 74	0.030 25	8.962 84	9.998 16	115 41.3	0.532 57	0.013 74
50	0.553 78	+0.001 43	8.962 63	9.998 16	118 11.3	0.532 57	0.013 74
8 0	-0.460 82	-0.027 39	+8.962 42	+9.998 17	120 41.4	+0.532 58	-0.013 73
10	0.367 86	0.056 21	8.962 21	9.998 17	123 11.4	0.532 58	0.013 73
20	0.274 90	0.085 03	8.962 00	9.998 17	125 41.5	0.532 58	0.013 73
30	0.181 94	0.113 86	8.961 79	9.998 17	128 11.5	0.532 58	0.013 72
40	-0.088 97	0.142 69	8.961 58	9.998 17	130 41.6	0.532 59	0.013 72
50	+0.004 00	0.171 52	8.961 37	9.998 18	133 11.6	0.532 59	0.013 72
9 0	+0.096 97	-0.200 35	+8.961 16	+9.998 18	135 41.7	+0.532 59	-0.013 72
10	0.189 94	0.229 18	8.960 95	9.998 18	138 11.7	0.532 59	0.013 72
20	0.282 90	0.258 02	8.960 73	9.998 18	140 41.8	0.532 59	0.013 72
30	0.375 86	0.286 85	8.960 52	9.998 18	143 11.8	0.532 59	0.013 73
40	0.468 82	0.315 69	8.960 31	9.998 18	145 41.9	0.532 58	0.013 73
50	0.561 78	0.344 52	8.960 10	9.998 19	148 11.9	0.532 58	0.013 73
10 0	+0.654 74	-0.373 36	+8.959 89	+9.998 19	150 42.0	+0.532 58	-0.013 73
10	0.747 69	0.402 19	8.959 68	9.998 19	153 12.0	0.532 57	0.013 74
20	0.840 64	0.431 03	8.959 47	9.998 19	155 42.1	0.532 57	0.013 74
30	0.933 59	0.459 86	8.959 26	9.998 19	158 12.1	0.532 56	0.013 75
40	1.026 54	0.488 70	8.959 05	9.998 19	160 42.2	0.532 56	0.013 75
50	1.119 48	0.517 54	8.958 84	9.998 20	163 12.2	0.532 55	0.013 76
11 0	+1.212 42	-0.546 38	+8.958 62	+9.998 20	165 42.3	+0.532 54	-0.013 77
10	1.305 34	0.575 22	8.958 41	9.998 20	168 12.3	0.532 53	0.013 78
20	1.398 26	0.604 06	8.958 20	9.998 20	170 42.4	0.532 52	0.013 79
30	+1.491 18	-0.632 90	+8.957 99	+9.998 20	173 12.4	+0.532 51	-0.013 80
Greenwich Mean Time.	Log <i>x'</i> for 1 Minute.		Log <i>y'</i> for 1 Minute.		Log <i>μ'</i> for 1 Minute.	Log Tangents of Angles of Cones.	
						Penumbra.	Shadow.
h m							
6 0	+ 7.9682		- 7.4594		+ 1.1762	7.666 85	7.664 68
7 0	7.9683		7.4596		1.1762	7.666 86	7.664 69
8 0	7.9683		7.4597		1.1762	7.666 86	7.664 69
9 0	7.9683		7.4599		1.1762	7.666 86	7.664 69
10 0	7.9683		7.4599		1.1762	7.666 87	7.664 70
11 0	7.9682		7.4600		1.1762	7.666 87	7.664 70
12 0	+ 7.9680		- 7.4601		+ 1.1762	7.666 88	7.664 71



# TOTAL ECLIPSE OF S

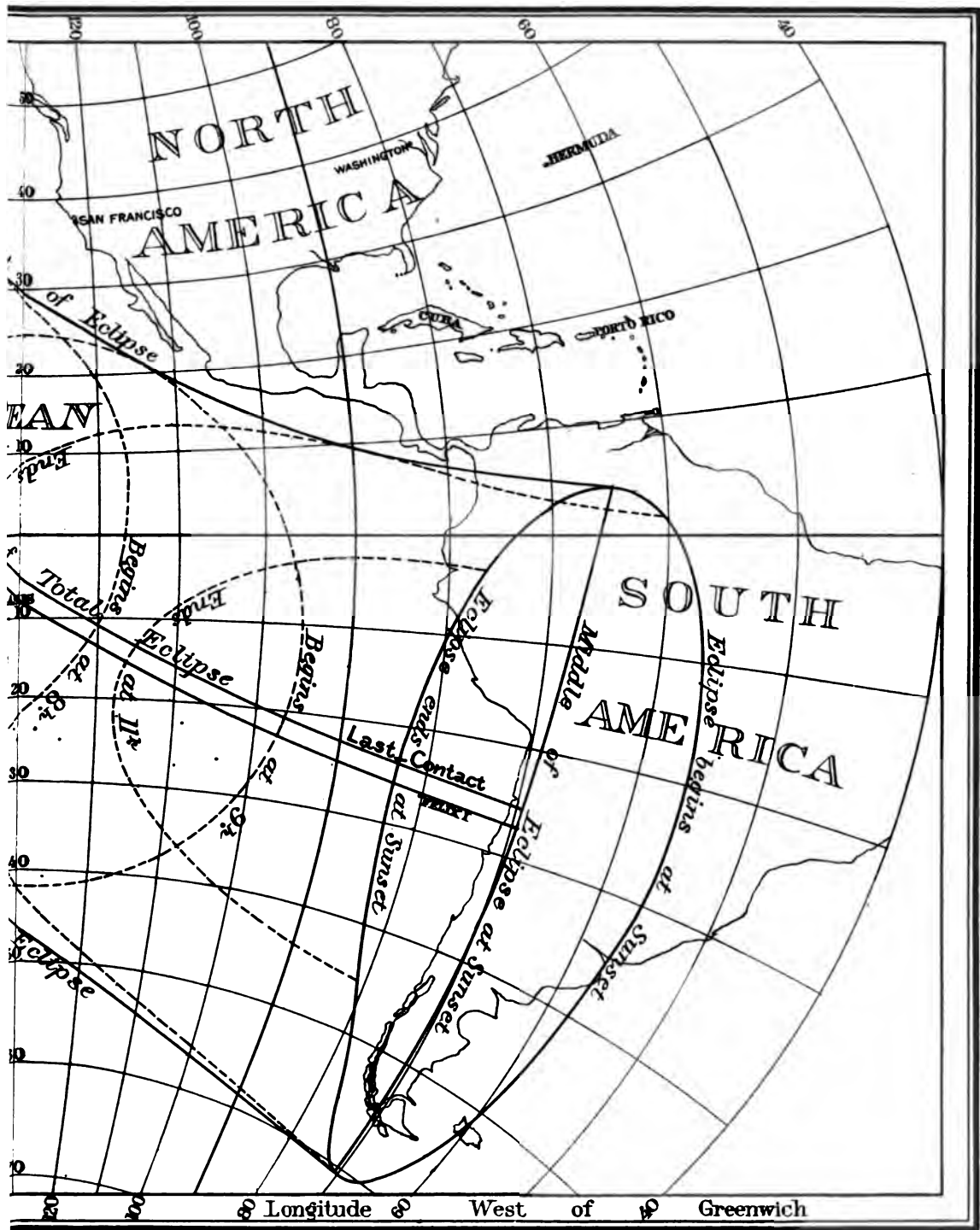


THE HORNS PETERS CO. PHOTO-LITHO. WASHINGTON, D. C.

Note: The hours of beginning and ending



SEPTEMBER 9<sup>TH</sup> 1904



*are expressed in Greenwich Mean Time.*



PATH OF THE SHADOW DURING THE TOTAL ECLIPSE  
OF THE SUN, 1904, SEPTEMBER 9.

Greenwich Mean Time.	Northern Limit of Shadow Path.		Central Line.		Southern Limit of Shadow Path.		Duration of Totality on Central Line.
	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	
Limits.	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	m s
7 <sup>h</sup> 5 <sup>m</sup>	+ 8 41.0	162 47.7 E.	+ 7 53.0	162 49.7 E.	+ 7 4.9	162 51.5 E.	
	9 27.8	174 13.5 E.	8 35.5	173 37.6 E.	7 43.2	173 1.7 E.	3 18.6
10	9 31.9	177 10.6 W.	8 38.7	177 36.0 W.	7 45.5	178 1.4 W.	3 46
15	9 16.1	171 43.6	8 22.0	172 7.6	7 27.9	172 31.6	4 6.7
20	8 53.1	167 30.2	7 58.3	167 54.3	7 3.5	168 18.4	4 23.8
25	8 24.9	163 59.2	7 29.6	164 23.7	6 34.3	164 48.2	4 38.8
30	+ 7 53.2	160 56.5	+ 6 57.6	161 21.6	+ 6 2.0	161 46.7	4 52.7
35	7 19.1	158 14.3	6 23.2	158 40.1	5 27.3	159 5.9	5 5.1
40	6 43.1	155 47.4	5 47.0	156 14.0	4 50.9	156 40.6	5 16.5
45	6 5.1	153 32.8	5 9.0	154 0.1	4 12.9	154 27.4	5 27.0
50	5 25.8	151 27.9	4 29.6	151 55.9	3 33.4	152 23.9	5 36.5
55	4 45.2	149 31.2	3 49.0	149 59.8	2 52.8	150 28.4	5 45.1
8 0	+ 4 3.5	147 41.2	+ 3 7.3	148 10.4	+ 2 11.1	148 39.6	5 52.9
5	3 20.6	145 56.7	2 24.5	146 26.4	1 28.4	146 56.1	5 59.8
10	2 36.8	144 16.9	1 40.7	144 47.1	0 44.6	145 17.3	6 5.8
15	1 52.1	142 40.8	0 56.1	143 11.4	+ 0 0.1	143 42.0	6 11.0
20	1 6.5	141 7.9	+ 0 10.6	141 38.9	- 0 45.3	142 9.9	6 15.3
25	+ 0 20.1	139 37.5	- 0 35.7	140 8.8	1 31.5	140 40.1	6 18.6
30	- 0 27.3	138 9.2	- 1 22.9	138 40.7	- 2 18.5	139 12.2	6 21.1
35	1 15.5	136 42.4	2 10.9	137 14.0	3 6.3	137 45.6	6 22.7
40	2 4.3	135 16.7	2 59.6	135 48.3	3 54.9	136 19.9	6 23.6
45	2 53.9	133 51.5	3 49.1	134 23.1	4 44.3	134 54.7	6 23.7
50	3 44.4	132 26.2	4 39.5	132 57.9	5 34.6	133 29.6	6 23.0
55	4 35.7	131 0.7	5 30.7	131 32.3	6 25.7	132 3.9	6 21.3
9 0	- 5 27.8	129 34.3	- 6 22.7	130 5.8	- 7 17.6	130 37.3	6 18.8
5	6 20.8	128 6.8	7 15.6	128 38.0	8 10.4	129 9.2	6 15.6
10	7 14.8	126 37.2	8 9.5	127 8.1	9 4.2	127 39.0	6 11.5
15	8 9.6	125 5.3	9 4.3	125 35.8	9 59.0	126 6.3	6 6.6
20	9 5.6	123 30.3	10 0.2	124 0.3	10 54.8	124 30.3	6 0.9
25	10 2.6	121 51.6	10 57.2	122 20.9	11 51.8	122 50.2	5 54.4
30	- 11 0.7	120 8.0	- 11 55.3	120 36.6	- 12 49.9	121 5.2	5 47.1
35	12 0.0	118 18.9	12 54.6	118 46.6	13 49.2	119 14.3	5 39.1
40	13 0.8	116 22.7	13 55.4	116 49.3	14 50.0	117 15.9	5 30.2
45	14 3.5	114 17.8	14 58.0	114 43.3	15 52.5	115 8.8	5 20.5
50	15 7.9	112 2.3	16 2.4	112 26.5	16 56.9	112 50.7	5 9.9
55	16 14.5	109 33.0	17 8.9	109 55.5	18 3.3	110 18.0	4 58.3
10 0	- 17 23.4	106 46.8	- 18 17.8	107 7.2	- 19 12.2	107 27.6	4 45.7
5	18 35.7	103 36.8	19 30.0	103 54.6	20 24.3	104 12.4	4 32.4
10	19 52.2	99 53.6	20 46.4	100 8.1	21 40.6	100 22.6	4 17.2
15	21 15.1	95 18.0	22 9.1	95 27.7	23 3.1	95 37.4	4 0.1
20	22 48.5	89 6.3	23 42.3	89 7.4	24 36.1	89 8.5	3 39.2
Limits.	- 25 49.7	69 43.1 W.	- 26 38.0	69 45.2 W.	- 27 25.5	69 48.9 W.	

## WASHINGTON MEAN TIME

## PHASES OF THE MOON.

New Moon.				First Quarter.				Full Moon.				Last Quarter.			
d	h	m		d	h	m		d	h	m		d	h	m	
January	16	22	38.3	January	25	3	32.7	January	2	12	39.1	January	9	4	1.8
February	15	17	56.4	February	23	18	0.4	January	31	23	24.9	February	7	16	47.9
March	16	12	30.9	March	24	4	28.5	March	1	9	40.1	March	8	7	52.3
April	15	4	44.9	April	22	11	46.4	March	30	19	36.1	April	7	0	45.1
May	14	17	50.1	May	21	17	10.4	April	29	5	27.9	May	6	18	42.1
June	13	4	2.2	June	19	22	2.3	May	28	15	46.3	June	5	12	44.5
July	12	12	19.0	July	19	3	40.3	June	27	3	15.1	July	5	5	45.9
August	10	19	49.8	August	17	11	18.8	July	26	16	33.6	August	3	20	54.5
September	9	3	34.5	September	15	22	4.4	August	25	7	53.7	September	2	9	50.2
October	8	12	16.6	October	15	12	45.9	September	24	0	41.4	October	1	20	43.8
November	6	22	28.4	November	14	7	27.2	October	23	17	47.5	October	31	6	5.0
December	6	10	38.1	December	14	4	58.6	November	22	10	3.9	November	29	14	29.7
								December	22	0	52.7	December	28	22	37.7

## PERIGEE, APOGEE, AND GREATEST LIBRATION.

Perigee.		Apogee.		Greatest Libration.									
	d	h		d	h	d	h	m		d	h	m	
January	3	19.4	January	19	5.9	January	10	7	37 W.	January	26	7	54 E.
February	1	7.0	February	15	7.3	February	7	9	53 W.	February	23	14	21 E.
February	29	19.8	March	13	12.9	March	6	17	35 W.	March	22	11	17 E.
March	29	4.6	April	10	4.4	April	3	23	24 W.	April	18	7	2 E.
April	26	1.5	May	7	23.2	May	1	22	0 W.	May	14	15	2 E.
May	22	5.4	June	4	18.3	May	29	6	55 W.	June	10	20	21 E.
June	16	19.4	July	2	12.3	June	24	18	40 W.	July	8	15	46 E.
July	14	11.1	July	30	3.0	July	21	9	1 W.	August	5	18	34 E.
August	11	16.2	August	26	11.1	August	18	0	26 W.	September	3	0	11 E.
September	9	2.1	September	22	12.9	September	15	3	10 W.	October	1	3	29 E.
October	7	13.0	October	19	21.0	October	13	9	2 W.	October	28	17	17 E.
November	4	19.2	November	16	13.8	November	10	12	44 W.	November	23	23	28 E.
December	2	7.2	December	14	10.5	December	8	7	48 W.	December	20	15	46 E.
December	26	23.6											

## FORMULÆ FOR THE LIBRATION OF THE MOON.

Let  $I$  = the inclination of the Moon's equator to the ecliptic ( $= 1^\circ 28' 8''$ ),

$\Omega$  = the mean longitude of the Moon's ascending node, or the mean longitude of the descending node of the Moon's equator,

$C$  = the angle at the center of the Moon's disk made by a lunar meridian with the circle of declination, counted from north to east on the apparent disk,

$\lambda, \beta, \alpha, \delta$  = the apparent longitude, latitude, right ascension, and declination of the Moon, corrected for parallax,

$\lambda'$  = the selenocentric longitude of the Earth, counted on the Moon's equator from its descending node,  $\Omega$ ,

$i, \Delta, \Omega', \zeta$  = the quantities defined on page 284, where their values for the current year are given.

The Moon's libration in longitude and latitude may then be found, for any time, by means of the following formulæ, in connection with the tables given on pages 284 and 285:—

$$\left. \begin{aligned} \mu &= -0.574 \sin 2(\Omega - \lambda) \\ A &= \sin I \cos (\Omega - \lambda) \\ \tan B &= \tan I \sin (\Omega - \lambda) \\ \lambda' &= \lambda + \mu + Ab \end{aligned} \right\} \text{See table, page 285.}$$

$$\begin{aligned} \text{The libration in latitude} &= b = B - \beta \\ \text{The libration in longitude} &= l = \lambda' - \zeta \\ \sin C &= \sin i \frac{\cos (\lambda' + \Delta - \Omega)}{\cos \delta} = -\sin i \frac{\cos (\alpha - \Omega')}{\cos \beta} \end{aligned}$$

MEAN PLACES FOR 1904.0. (January 1<sup>d</sup>.068, Washington.)

Name of Star.	Magni- tude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Motion.
		h m s	s	° "	"
B. A. C. 57 . . . . .	7.0	0 12 51.841	+ 0.0070	+ 1 9 17.32	+ 0.023
B. A. C. 167 . . . . .	7.5	0 34 12.096	+ 0.0510	2 35 52.33	+ 0.287
B. A. C. 237 . . . . .	6.7	0 46 21.652	+ 0.0008	2 51 51.56	- 0.069
B. A. C. 243 . . . . .	7.3	0 48 22.950	.....	3 33 57.24	.....
73 Piscium . . . . .	6.4	0 59 54.025	+ 0.0008	5 8 30.22	- 0.004
77 Piscium . . . . .	6.1	1 0 51.067	- 0.0008	+ 4 23 49.77	- 0.119
7 Piscium . . . . .	5.7	1 3 25.346	- 0.0195	5 8 31.05	- 0.174
88 Piscium . . . . .	6.2	1 9 42.680	- 0.0020	6 29 15.12	- 0.028
B. A. C. 410. . . . .	7.4	1 17 55.423	.....	6 54 35.07	.....
96 Piscium . . . . .	6.6	1 24 2.335	- 0.0028	6 47 54.51	- 0.065
μ Piscium . . . . .	5.2	1 25 9.202	+ 0.0177	+ 5 38 56.71	- 0.031
64 Ceti . . . . .	5.7	2 6 16.853	- 0.0105	8 7 13.54	- 0.100
ε Arietis . . . . .	5.4	2 19 40.109	- 0.0007	10 10 33.02	- 0.013
B. A. C. 755 . . . . .	7.0	2 21 36.614	+ 0.0022	10 8 0.26	- 0.019
25 Arietis . . . . .	7.3	2 22 16.954	- 0.0194	9 46 19.64	- 0.224
31 Arietis . . . . .	5.6	2 31 23.650	+ 0.0177	+ 12 1 53.09	- 0.075
38 Arietis . . . . .	5.2	2 39 43.572	+ 0.0073	12 2 30.92	- 0.069
W. B. ii, 1033 . . . . .	5.9	3 1 7.328	.....	12 49 3.01	.....
B. A. C. 987 . . . . .	6.3	3 6 5.438	.....	12 41 1.75	.....
W. B. iii, 275 . . . . .	6.2	3 18 52.991	.....	12 17 21.31	.....
B. A. C. 1272 . . . . .	6.3	4 2 29.432	.....	+ 17 5 0.64	.....
W. B. (2) iv, 59 . . . . .	6.4	4 7 0.657	.....	17 1 50.68	.....
48 Tauri . . . . .	6.4	4 10 19.138	+ 0.0074	15 9 38.75	- 0.010
55 Tauri . . . . .	7.3	4 14 24.990	+ 0.0073	16 17 28.28	- 0.050
δ <sup>1</sup> Tauri . . . . .	4.0	4 17 23.789	+ 0.0066	17 19 3.45	- 0.025
63 Tauri . . . . .	5.6	4 17 54.477	+ 0.0066	+ 16 33 11.61	- 0.040
δ <sup>2</sup> Tauri . . . . .	4.7	4 18 33.649	+ 0.0008	17 13 18.45	- 0.046
δ <sup>3</sup> Tauri . . . . .	4.2	4 19 55.965	+ 0.0065	17 42 30.97	- 0.025
70 Tauri . . . . .	6.3	4 20 8.318	+ 0.0057	15 43 19.03	- 0.025
71 Tauri . . . . .	6.0	4 20 52.453	+ 0.0069	15 24 1.40	- 0.033
75 Tauri . . . . .	5.3	4 22 56.991	- 0.0009	+ 16 8 43.25	+ 0.008
θ <sup>1</sup> Tauri . . . . .	3.9	4 23 5.201	+ 0.0048	15 44 57.41	- 0.015
θ <sup>2</sup> Tauri . . . . .	3.6	4 23 10.685	+ 0.0064	15 39 31.49	- 0.003
80 Tauri . . . . .	5.6	4 24 39.986	+ 0.0050	15 25 42.47	- 0.004
B. A. C. 1391 . . . . .	5.0	4 25 3.817	+ 0.0051	15 59 7.47	- 0.037
81 Tauri . . . . .	5.5	4 25 10.170	+ 0.0069	+ 15 28 59.52	- 0.018
B. A. C. 1394 . . . . .	7.5	4 25 16.9..	.....	15 56 28.32	- 0.025
85 Tauri . . . . .	6.5	4 26 22.719	+ 0.0070	15 38 44.78	- 0.040
B. A. C. 1406 . . . . .	7.5	4 28 8.359	+ 0.0001	16 7 15.51	- 0.032
89 Tauri . . . . .	6.5	4 32 39.566	+ 0.0054	15 50 28.46	- 0.011
σ <sup>2</sup> Tauri . . . . .	4.8	4 33 46.925	+ 0.0050	+ 15 43 40.45	- 0.022
B. A. C. 1526 . . . . .	5.8	4 51 49.572	- 0.0012	17 0 10.61	- 0.028
104 Tauri . . . . .	5.1	5 1 46.514	+ 0.0375	18 30 59.35	+ 0.022
111 Tauri . . . . .	5.2	5 18 49.231	+ 0.0157	17 17 40.35	+ 0.006
115 Tauri . . . . .	5.4	5 21 34.048	+ 0.0006	+ 17 52 48.87	- 0.004

MEAN PLACES FOR 1904.0. (January 1 <sup>d</sup> .068, Washington.)									
Name of Star.	Magni- tude.	Right Ascension.			Annual Proper Motion.	Declination.			Annual Proper Motion.
		h	m	s	s	°	'	"	"
117 Tauri . . . . .	6.3	5	22	27.174	-0.0001	+ 17	9	33.09	-0.081
W. B. (2) v, 606 . . . . .	7.0	5	23	42.217	.....	18	17	16.42	....
119 Tauri . . . . .	4.6	5	26	35.002	-0.0003	18	31	23.01	-0.002
120 Tauri . . . . .	5.3	5	27	54.060	+0.0005	18	28	19.93	+0.006
122 Tauri . . . . .	5.4	5	31	29.441	+0.0024	16	58	52.01	-0.039
B. A. C. 1796 . . . . .	7.5	5	36	49.778	+0.0005	+ 18	56	24.52	-0.085
127 Tauri . . . . .	6.3	5	37	14.708	+0.0020	18	56	0.58	-0.042
130 Tauri . . . . .	5.5	5	41	50.283	-0.0013	17	41	36.09	+0.001
γ <sup>3</sup> Orionis . . . . .	5.1	5	57	46.413	+0.0016	19	41	32.51	-0.012
71 Orionis . . . . .	5.1	6	9	11.903	-0.0079	19	11	21.72	-0.170
W. B. (2) vi, 286 . . . . .	6.5	6	13	26.890	0.0000	+ 17	21	46.67	0.000
20 Geminorum . . . . .	6.3	6	26	41.706	+0.0033	17	50	50.51	+0.012
21 Geminorum . . . . .	6.5	6	26	42.445	+0.0021	17	51	8.71	+0.028
22 Geminorum . . . . .	7.2	6	28	59.311	-0.0016	19	30	12.28	-0.002
23 Geminorum . . . . .	7.1	6	30	28.630	-0.0003	16	52	29.72	+0.010
26 Geminorum . . . . .	5.1	6	36	48.918	-0.0009	+ 17	44	22.02	-0.080
W. B. (2) vi, 1630 . . . . .	6.2	6	56	50.511	.....	17	53	31.17	....
51 Geminorum . . . . .	5.4	7	7	51.523	+0.0003	16	19	19.77	-0.033
λ Geminorum . . . . .	3.6	7	12	34.566	-0.0039	16	42	49.75	-0.026
B. A. C. 2432 . . . . .	7.0	7	17	29.947	.....	18	27	28.88	....
W. B. (2) vii, 685 . . . . .	5.6	7	26	16.268	.....	+ 17	17	27.14	....
67 Geminorum . . . . .	7.5	7	27	56.370	+0.0010	15	50	43.44	+0.001
68 Geminorum . . . . .	5.0	7	28	7.805	-0.0023	16	1	59.58	-0.005
f Geminorum . . . . .	5.2	7	33	55.981	-0.0019	17	53	37.11	+0.018
1 Cancri . . . . .	5.9	7	51	32.411	-0.0030	16	2	48.46	-0.026
B. A. C. 2649 . . . . .	6.3	7	53	2.883	.....	+ 16	46	38.84	....
3 Cancri . . . . .	6.0	7	55	17.235	-0.0022	17	34	19.30	+0.010
5 Cancri . . . . .	6.4	7	56	2.039	-0.0018	16	43	12.80	+0.003
Piazzii viii, 6 . . . . .	5.5	8	6	42.772	+0.0033	17	56	12.41	-0.104
29 Cancri . . . . .	5.9	8	23	15.915	-0.0028	14	31	43.67	-0.005
B. A. C. 2872 . . . . .	6.8	8	28	26.051	.....	+ 13	35	9.96	....
B. A. C. 3122 . . . . .	7.0	9	4	33.443	.....	11	57	20.98	....
ε Leonis . . . . .	5.2	9	26	46.308	-0.0076	11	43	30.87	-0.060
B. A. C. 3398 . . . . .	6.0	9	51	20.636	-0.0077	9	23	17.33	+0.028
11 Sextantis . . . . .	6.0	9	53	2.520	+0.0027	8	46	20.48	-0.032
A Leonis . . . . .	4.6	10	2	48.563	-0.0082	+ 10	28	5.57	-0.038
B. A. C. 3538 . . . . .	7.0	10	17	10.525	.....	9	26	54.75	....
43 Leonis . . . . .	6.5	10	17	59.038	-0.0028	7	1	47.45	-0.091
44 Leonis . . . . .	6.2	10	20	11.703	.....	9	16	23.35	....
48 Leonis . . . . .	5.2	10	29	47.544	-0.0086	7	26	52.83	+0.067
35 Sextantis (1 <sup>st</sup> star) . . . . .	6.0	10	38	21.554	0.0000	+ 5	15	2.82	0.000
37 Sextantis . . . . .	6.2	10	41	5.757	-0.0029	6	52	45.14	-0.028
56 Leonis . . . . .	6.6	10	51	2.516	-0.0045	6	41	52.76	-0.066
δ Leonis . . . . .	5.0	10	55	36.114	-0.0018	4	7	58.65	-0.012
82 Leonis . . . . .	6.9	11	20	43.452	-0.0012	+ 3	49	47.70	-0.055

MEAN PLACES FOR 1904.0. (January 1<sup>d</sup>.068, Washington.)

Name of Star.	Magni- tude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Motion.
		h m s	s	° ' "	"
83 Leonis . . . . .	6.1	11 21 53.681	-0.0514	+ 3 32 10.65	+ 0.118
W. B. xi, 349 . . . . .	5.1	11 23 0.807	-0.0010	3 21 33.76	-0.006
89 Leonis . . . . .	6.2	11 29 27.183	-0.0123	3 35 35.92	-0.110
$\beta$ Virginis . . . . .	3.7	11 45 41.651	+0.0481	+ 2 18 20.54	-0.262
13 Virginis . . . . .	6.3	12 13 44.955	-0.0001	- 0 15 13.26	-0.029
38 Virginis . . . . .	6.2	12 48 16.153	-0.0174	- 3 1 53.94	-0.007
$\lambda$ Virginis . . . . .	5.9	12 54 42.707	-0.0036	3 17 39.64	+0.010
46 Virginis . . . . .	6.1	12 55 39.128	-0.0041	2 51 8.75	+0.064
48 Virginis . . . . .	6.6	12 58 57.540	-0.0060	3 8 48.40	-0.018
66 Virginis . . . . .	5.8	13 19 33.319	+0.0087	4 39 44.99	-0.022
$\iota^1$ Virginis . . . . .	6.1	13 25 25.134	+0.0018	- 5 58 28.68	+0.023
$\iota^2$ Virginis . . . . .	4.9	13 26 58.314	-0.0081	5 45 36.41	-0.030
77 Virginis . . . . .	7.0	13 28 23.522	-0.0052	7 7 46.78	0.000
80 Virginis . . . . .	5.8	13 30 31.543	+0.0089	4 54 25.84	-0.001
81 Virginis . . . . .	7.0	13 32 33.288	-0.0030	7 22 56.25	-0.040
B. A. C. 4591 . . . . .	6.3	13 42 8.874	.....	- 9 13 42.69	.....
B. A. C. 4647 . . . . .	6.4	13 49 56.039	-0.0139	7 35 10.88	0.000
94 Virginis . . . . .	6.8	14 1 12.607	-0.0032	8 26 1.63	+0.012
95 Virginis . . . . .	5.7	14 1 38.041	-0.0122	8 51 19.64	-0.015
96 Virginis . . . . .	6.5	14 3 53.580	-0.0007	9 52 48.17	+0.019
2 Libræ . . . . .	6.3	14 18 15.565	-0.0031	-11 16 32.83	-0.059
B. A. C. 4772 . . . . .	6.6	14 19 31.271	-0.0030	11 14 3.49	-0.045
B. A. C. 4828 . . . . .	6.0	14 31 53.296	-0.0586	11 53 50.85	+0.387
$\xi^1$ Libræ . . . . .	5.9	14 49 9.970	-0.0061	11 30 25.28	-0.011
$\xi^2$ Libræ . . . . .	5.8	14 51 33.377	-0.0019	11 1 21.14	+0.006
17 Libræ . . . . .	7.2	14 53 3.768	-0.0041	-10 46 10.06	-0.001
18 Libræ . . . . .	6.2	14 53 41.849	-0.0084	10 45 31.94	-0.072
$\alpha^1$ Libræ . . . . .	6.0	15 15 39.274	+0.0007	15 12 9.52	+0.038
$\alpha^2$ Libræ . . . . .	6.3	15 17 40.342	-0.0025	14 47 30.15	+0.013
$\gamma$ Libræ . . . . .	4.0	15 30 9.257	+0.0037	14 28 10.89	+0.019
B. A. C. 5188 . . . . .	6.6	15 38 1.9..	0.0000	-14 44 7.77	-0.102
$\eta$ Libræ . . . . .	5.5	15 38 40.133	-0.0045	15 22 2.76	-0.063
$\theta$ Libræ . . . . .	4.3	15 48 21.449	+0.0067	16 26 52.91	+0.131
48 Libræ . . . . .	4.8	15 52 48.558	-0.0028	14 0 9.42	-0.014
49 Libræ . . . . .	5.6	15 54 56.170	-0.0474	16 15 2.94	-0.368
$\phi$ Ophiuchi . . . . .	4.4	16 25 38.489	-0.0051	-16 24 13.86	-0.028
24 Scorpii . . . . .	5.2	16 36 1.111	-0.0027	17 33 24.42	+0.018
B. A. C. 5695 . . . . .	6.2	16 50 29.192	.....	16 39 14.11	.....
B. A. C. 5771 . . . . .	6.2	17 2 40.263	.....	17 28 56.10	.....
B. A. C. 5839 . . . . .	6.0	17 14 18.052	.....	17 39 22.59	.....
B. A. C. 6060 . . . . .	6.5	17 50 16.122	.....	-18 47 2.57	.....
B. A. C. 6086 . . . . .	6.1	17 55 48.388	-0.0017	17 9 13.15	+0.012
B. A. C. 6201 . . . . .	7.3	18 13 4.940	.....	18 39 23.36	.....
Y Sagittæ . . . . .	Var.	18 15 44.080	.....	18 54 10.81	.....
B. A. C. 6267 . . . . .	6.7	18 22 20.404	.....	-17 51 32.63	.....

MEAN PLACES FOR 1904.0. (January 1 <sup>d</sup> .068, Washington.)						
Name of Star.	Magni- tude.	Right Ascension.			Declination.	Annual Proper Motion.
		h	m	s	° ' "	"
B. A. C. 6287 . . .	6.0	18	24	33.235	- 18 47 22.19	....
B. A. C. 6294 . . .	5.2	18	25	48.808	18 28 7.32	....
$\rho^1$ Sagittarii . . .	3.9	19	16	6.291	18 1 41.94	+ 0.026
$\rho^2$ Sagittarii . . .	6.1	19	16	14.877	18 29 11.75	- 0.065
B. A. C. 6658 . . .	7.0	19	22	30.243	18 33 13.07	....
B. A. C. 6710 . . .	6.0	19	31	29.172	- 18 26 40.71	....
$\epsilon^1$ Sagittarii . . .	5.6	19	35	13.413	16 30 49.78	- 0.039
$\epsilon^2$ Sagittarii . . .	5.0	19	37	1.638	16 20 57.86	- 0.007
B. A. C. 6746 . . .	5.5	19	38	4.809	15 41 31.83	....
$\zeta$ Sagittarii . . .	5.0	19	52	30.339	15 44 47.34	- 0.081
B. A. C. 6992 . . .	6.2	20	15	22.932	- 15 5 17.00	0.000
$\beta$ Capricorni . . .	3.4	20	15	37.061	15 5 5.94	+ 0.022
B. A. C. 7009 . . .	7.0	20	18	4.100	14 33 53.25	....
Lalande 39247 . . .	7.4	20	20	41.045	15 17 36.55	....
B. A. C. 7087 . . .	6.2	20	28	50.991	14 3 7.54	....
Piazzi xx, 194 . . .	6.2	20	30	6.291	- 16 51 21.10	....
$\tau^1$ Capricorni . . .	7.0	20	31	58.363	15 28 48.42	- 0.040
$\tau^2$ Capricorni . . .	5.3	20	33	54.290	15 17 31.44	- 0.012
W. B. xx, 1293 . . .	6.0	20	53	22.975	14 51 15.51	....
8 Aquarii . . .	6.8	20	54	38.302	13 26 5.83	- 0.001
9 Aquarii . . .	7.0	20	55	50.852	- 13 54 20.85	- 0.006
18 Aquarii . . .	5.4	21	18	56.711	13 17 25.80	+ 0.002
W. B. xxi, 749 . . .	6.3	21	34	18.508	11 0 32.01	0.000
$\epsilon^2$ Capricorni . . .	6.2	21	41	8.963	9 43 8.99	+ 0.001
$\lambda$ Capricorni . . .	5.4	21	41	22.066	11 48 32.53	- 0.013
B. A. C. 7620 . . .	6.5	21	48	28.047	- 10 45 50.26	....
B. A. C. 7697 . . .	6.8	22	2	11.295	10 54 54.99	....
36 Aquarii . . .	6.3	22	4	22.282	8 39 28.25	+ 0.045
B. A. C. 7774 . . .	6.2	22	11	48.587	9 31 7.54	- 0.011
$\rho$ Aquarii . . .	5.4	22	15	8.823	8 18 12.57	+ 0.007
B. A. C. 7804 . . .	6.2	22	18	30.2..	- 7 40 45.5.	....
W. B. xxii, 493 . . .	6.2	22	26	15.974	7 2 40.61	....
67 Aquarii . . .	6.2	22	38	13.412	7 27 56.35	+ 0.023
B. A. C. 7986 . . .	5.8	22	50	12.227	5 29 58.36	....
B. A. C. 7993 . . .	6.6	22	52	18.996	5 19 24.01	- 0.001
B. A. C. 8017 . . .	6.1	22	56	33.5..	- 5 13 43.0.	....
B. A. C. 8094 . . .	5.6	23	10	37.538	4 1 11.30	....
11 Piscium . . .	6.5	23	24	31.303	2 19 11.32	+ 0.008
13 Piscium . . .	6.4	23	27	1.984	1 36 57.41	+ 0.024
14 Piscium . . .	5.9	23	29	12.805	1 46 40.15	- 0.004
20 Piscium . . .	5.7	23	43	0.413	- 3 17 41.44	- 0.003
W. B. xxiii, 1069 . . .	6.9	23	54	51.349	- 0 48 51.24	....



## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

THE STAR'S				AT CONJUNCTION IN R. A.							Limiting Parallels.	
Name.	Magn.	Red'ns from 1904.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	$\gamma'$	$x'$	$y'$	N.	S.	
		$\Delta\alpha$	$\Delta\delta$		d h m	h m				°	°	
111 Tauri	5.2	+1.45	-9.0	+17 17.5	1 2 17.7	-8 21.0	+0.8897	0.6063	+0.0330	+90	+33	
115 Tauri	6.0	1.46	9.0	17 52.7	3 22.3	-7 19.0	+0.3376	0.6068	0.0308	+56	+1	
117 Tauri	6.3	1.45	9.1	17 9.4	3 43.0	-6 59.1	+1.0694	0.6070	0.0301	+90	+47	
W. B. (2), 606	7.0	1.46	9.0	18 17.1	4 12.5	-6 30.8	-0.0452	0.6072	0.0290	+28	-20	
119 Tauri	4.6	1.47	9.1	18 31.2	5 20.0	-5 26.0	-0.2489	0.6077	0.0267	+20	-32	
120 Tauri	6.0	+1.47	-9.2	+18 28.2	5 50.9	-4 56.3	-0.1845	0.6079	+0.0256	+24	-28	
B. A. C. 1796	7.5	1.48	9.4	18 56.3	9 19.4	-1 36.3	-0.5750	0.6093	0.0182	+1	-55	
127 Tauri	6.3	1.48	9.4	18 55.9	9 29.1	-1 26.9	-0.5653	0.6094	0.0179	+2	-54	
130 Tauri	5.5	1.47	9.7	17 41.4	11 16.1	+0 15.9	+0.6997	0.6100	0.0140	+90	+23	
$\gamma^3$ Orionis	5.1	1.50	10.1	19 41.4	17 25.5	+6 10.3	-1.2442	0.6119	+0.0001	-57	-70	
71 Orionis	5.1	+1.50	-10.4	+19 11.2	21 49.2	+11 23.4	-0.7604	0.6132	-0.0090	-11	-71	
20 Geminorum	6.3	1.49	11.0	17 50.7	2 4 31.5	-7 10.8	+0.4606	0.6140	0.0237	+65	+8	
21 Geminorum	6.5	1.49	11.0	17 51.0	4 31.8	-7 10.5	+0.4554	0.6140	0.0237	+65	+8	
22 Geminorum	7.2	1.49	11.0	19 30.0	5 24.2	-6 20.2	-1.2002	0.6143	0.0256	-48	-70	
26 Geminorum	5.1	1.48	11.1	17 44.2	8 23.7	-3 28.0	+0.4586	0.6144	0.0322	+65	+8	
W. B. (2), vi 1630	6.2	+1.46	-11.6	+17 53.3	16 2.7	+3 52.2	-0.0027	0.6147	-0.0489	+34	-20	
2 Geminorum	3.6	1.44	11.9	16 42.6	22 3.4	+9 38.1	+0.8260	0.6142	0.0617	+90	+26	
B. A. C. 2432	7.0	1.44	12.0	18 27.3	23 56.4	+11 26.5	-1.0126	0.6140	0.0658	-28	-72	
W. B. (2), vii, 685	5.6	1.42	12.1	17 17.2	3 18.0	-9 20.2	-0.0953	0.6135	0.0727	+29	-27	
68 Geminorum	5.0	1.41	12.1	16 1.8	4 0.8	-8 39.0	+1.0906	0.6134	0.0742	+90	+45	
7 Geminorum	5.2	+1.41	-12.2	+17 53.4	6 14.4	-6 30.9	-0.9111	0.6129	-0.0787	-20	-72	
1 Cancri	5.9	1.37	12.3	16 2.6	13 1.0	-0 0.9	+0.3270	0.6113	0.0922	+55	-6	
B. A. C. 2649	6.3	1.37	12.4	16 46.4	13 36.0	+0 32.7	-0.4459	0.6112	0.0933	+10	-51	
5 Cancri	6.4	1.36	12.3	16 43.0	14 45.2	+1 39.1	-0.4985	0.6106	0.0955	+6	-55	
29 Cancri	5.9	1.29	12.2	14 31.5	4 1 20.7	+11 49.2	+0.5406	0.6079	0.1150	+71	+4	
B. A. C. 2872	6.8	+1.28	-12.1	+13 35.0	3 13.9	-10 22.1	+1.2479	0.6064	-0.1182	+90	+59	
B. A. C. 3122	7.0	1.17	11.6	11 57.2	17 40.3	+3 30.2	+0.9796	0.5998	0.1409	+90	+29	
$\xi$ Leonis	5.2	1.09	11.2	11 43.3	5 2 37.8	-11 53.1	-0.1088	0.5953	0.1528	+28	-36	
$\theta$ Leonis	3.8	1.07	10.7	10 19.6	6 24.1	-8 15.3	+0.6860	0.5933	0.1572	+87	+7	
B. A. C. 3398	6.0	1.01	10.2	9 23.1	12 41.9	-2 11.9	+0.6062	0.5900	0.1641	+77	+2	
11 Sextantis	6.0	+1.01	-10.0	+8 46.2	13 24.0	-1 31.4	+1.1011	0.5896	-0.1648	+90	+35	
$\pi$ Leonis	5.0	1.00	9.9	8 30.1	14 16.1	-0 41.3	+1.2229	0.5892	0.1656	+90	+48	
A Leonis	4.6	0.96	10.2	10 27.9	17 27.4	+2 23.0	-1.2565	0.5874	0.1686	-50	-80	
B. A. C. 3538	7.0	0.90	9.5	9 26.8	23 28.5	+8 10.7	-1.2773	0.5842	0.1737	-53	-81	
43 Leonis	6.5	0.92	8.9	7 1.6	23 48.9	+8 30.3	+1.0682	0.5841	0.1739	+90	+32	
48 Leonis	5.2	+0.88	-8.7	+7 26.7	6 4 48.7	-10 40.9	-0.2254	0.5815	-0.1775	+22	-46	
35 Sext. (1 <sup>st</sup> star)	6.0	0.86	7.9	5 14.9	8 27.7	-7 9.9	+1.3138	0.5796	0.1798	+90	+61	
37 Sextantis	6.2	0.82	8.2	6 52.6	9 38.0	-6 2.1	-0.5222	0.5791	0.1804	+5	-67	
56 Leonis	6.6	0.77	7.9	6 41.7	13 54.5	-1 54.9	-1.1191	0.5770	0.1826	-34	-83	
d Leonis	5.0	0.77	7.0	4 7.9	15 52.7	-0 0.9	+1.0869	0.5761	0.1835	+90	+32	
82 Leonis	6.9	+0.66	-6.0	+3 49.7	7 2 50.3	+10 33.5	-0.6406	0.5711	-0.1870	-1	-79	
83 Leonis	6.1	0.65	5.9	3 32.1	3 21.2	+11 3.2	-0.4415	0.5710	0.1871	+10	-62	
$\tau$ Leonis	5.1	0.65	5.7	3 23.0	3 50.4	+11 31.8	-0.3803	0.5707	0.1872	+13	-57	
W. B. xi, 349	5.1	0.65	5.7	3 21.5	3 50.7	+11 31.7	-0.3555	0.5707	0.1872	+15	-56	
89 Leonis	6.2	0.61	5.6	3 35.5	6 41.3	-9 43.7	-1.1256	0.5695	0.1876	-34	-86	
$\beta$ Virginis	3.7	+0.55	-4.5	+2 18.3	13 54.2	-2 45.8	-1.1851	0.5668	-0.1881	-40	-88	
13 Virginis	6.3	0.43	2.6	-0 15.3	8 2 31.0	+9 24.9	-0.9601	0.5627	0.1867	-21	-90	
$\eta$ Virginis	4.1	0.42	2.6	0 8.0	3 4.8	+9 57.6	-1.1881	0.5625	0.1865	-40	-90	
38 Virginis	6.2	0.27	-0.2	3 1.9	18 15.2	+0 37.2	-1.0252	0.5588	0.1811	-26	-90	
k Virginis	5.9	0.25	+0.1	3 17.7	21 12.7	+3 28.8	-1.2906	0.5583	0.1796	-55	-90	
51 Virginis	4.4	+0.21	+1.1	-5 1.6	9 1 56.2	+8 2.8	-0.3494	0.5575	-0.1770	+14	-55	
71 Virginis	6.7	0.11	2.2	5 58.4	11 22.7	-6 49.5	-1.0152	0.5564	0.1708	-27	-90	
77 Virginis	7.0	0.10	2.7	7 7.7	12 45.4	-5 29.6	-0.0510	0.5561	0.1697	+30	-27	
81 Virginis	7.0	0.08	3.0	7 22.9	14 41.1	-3 37.8	-0.1147	0.5560	0.1682	+26	-41	
82 Virginis	5.3	0.07	3.4	8 13.1	16 32.8	-1 49.8	+0.4435	0.5558	0.1668	+60	-10	
B. A. C. 4591	6.3	+0.06	+4.0	-9 13.6	19 8.0	+0 40.3	+1.0671	0.5556	-0.1647	+81	+30	

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Parallels.	
Name.	Mag.	Red'ns from 1904.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.		
		$\Delta\alpha$	$\Delta\delta$										
		s	"	°	d h m	h m				°	°		
B. A. C. 4647	6.4	-0.01	+3.6	- 7 35.1	9 22 44.9	+ 4 10.0	-1.2360	0.5554	-0.1617	-49	-90		
94 Virginis	6.8	0.06	4.3	8 26.0	10 3 59.3	+ 9 14.0	-1.1883	0.5552	0.1569	-44	-90		
95 Virginis	5.7	0.05	4.8	8 51.2	4 11.1	+ 9 25.4	-0.7778	0.5552	0.1567	-12	-90		
96 Virginis	6.5	0.06	4.9	9 52.7	5 14.1	+10 26.3	+0.1312	0.5552	0.1557	+39	-27		
$\kappa$ Virginis	4.3	0.08	5.0	9 49.5	7 2.4	-11 49.0	-0.2038	0.5552	0.1539	+20	-46		
2 Libræ	6.3	-0.13	+5.8	-11 16.5	11 55.1	- 7 6.0	+0.5784	0.5551	-0.1491	+68	- 2		
B. A. C. 4772	6.6	0.14	5.8	11 14.0	12 30.2	- 6 32.1	+0.4479	0.5551	0.1484	+58	- 9		
B. A. C. 4828	6.0	0.20	6.4	11 53.7	18 15.4	- 0 58.3	+0.3108	0.5552	0.1423	+48	-17		
$\xi$ Libræ	5.9	0.29	6.7	11 30.3	11 2 17.7	+ 6 48.1	-1.2103	0.5554	0.1330	-50	-90		
$\nu$ Libræ	6.0	0.41	8.5	15 12.0	14 36.2	- 5 17.8	+1.1700	0.5560	0.1175	+75	+42		
$\alpha$ Libræ	6.3	-0.41	+8.4	-14 47.4	15 32.0	- 4 23.9	+0.6239	0.5560	-0.1163	+68	+ 1		
$\gamma$ Libræ	4.0	0.48	8.5	14 28.0	21 20.1	+ 1 12.7	-0.3711	0.5564	0.1085	+ 6	-58		
B. A. C. 5188	6.6	0.52	8.9	14 44.0	12 0 59.3	+ 4 44.6	-0.4758	0.5567	0.1034	- 1	-66		
$\eta$ Libræ	5.5	0.52	8.9	15 21.9	1 17.1	+ 5 1.7	+0.1701	0.5567	0.1030	+35	-25		
$\theta$ Libræ	4.3	0.57	9.3	16 26.7	5 46.5	+ 9 22.2	+0.8799	0.5570	0.0966	+74	+17		
49 Libræ	5.6	-0.60	+9.3	-16 14.9	8 49.4	-11 41.0	+0.3814	0.5570	-0.0922	+47	-13		
$\phi$ Ophiuchi	4.4	0.74	9.5	16 24.1	23 2.4	+ 2 3.7	-0.6147	0.5578	0.0708	-12	-80		
24 Scorpii	5.2	0.78	9.8	17 33.2	13 3 50.4	+ 6 42.0	+0.3089	0.5579	0.0633	+40	-17		
B. A. C. 5695	6.2	0.84	9.5	16 39.1	10 32.2	-10 49.6	-1.0579	0.5580	0.0526	-44	-90		
B. A. C. 5771	6.2	0.89	9.6	17 28.8	16 10.6	- 5 22.4	-0.4320	0.5582	0.0436	- 5	-63		
B. A. C. 5839	6.0	-0.94	+9.6	-17 39.2	21 33.9	- 0 9.9	-0.4549	0.5579	-0.0348	- 7	-65		
B. A. C. 6060	6.5	1.06	9.3	18 47.0	14 14 16.4	- 8 0.6	+0.4233	0.5568	-0.0075	+42	-10		
Y Sagittarii	Var.	1.13	8.7	18 54.0	15 2 10.3	+ 3 29.0	+0.5809	0.5553	+0.0120	+55	- 1		
B. A. C. 6267	6.7	1.14	8.4	17 51.4	5 16.2	+ 6 29.7	-0.5198	0.5549	0.0170	-12	-70		
NEW MOON.													
$\alpha$ Capricorni	6.2	-1.02	+1.3	- 9 43.1	19 6 51.8	+ 5 2.5	-1.1735	0.5290	+0.1415	-44	-90		
$\lambda$ Capricorni	5.4	1.05	1.0	11 48.5	6 58.5	+ 5 8.9	+1.1664	0.5289	0.1416	+78	+39		
B. A. C. 7620	6.5	1.02	0.8	10 45.8	10 38.8	+ 8 42.7	+0.5295	0.5280	0.1445	+65	- 5		
36 Aquarii	6.3	0.95	0.4	8 39.5	18 54.8	- 7 15.8	-0.5922	0.5261	0.1505	- 1	-75		
$\theta$ Aquarii	4.3	-0.93	+0.2	- 8 15.7	22 46.6	- 3 30.8	-0.4458	0.5253	+0.1532	+ 7	-63		
B. A. C. 7774	6.2	0.94	-0.1	9 31.1	22 47.9	- 3 29.5	+0.9549	0.5253	0.1532	+80	+21		
$\rho$ Aquarii	5.4	0.91	0.0	8 18.2	20 32.7	- 1 47.7	-0.1273	0.5249	0.1543	+25	-41		
B. A. C. 7804	6.2	0.90	0.0	7 40.8	2 18.2	- 0 5.3	-0.5488	0.5245	0.1554	+ 2	-71		
W. B. xxiii, 493	6.2	0.86	0.2	7 2.7	6 22.8	+ 3 52.1	-0.6154	0.5239	0.1578	- 2	-78		
67 Aquarii	6.2	-0.83	-0.9	- 7 28.0	12 40.4	+ 9 58.9	+0.8561	0.5229	+0.1611	+83	+14		
B. A. C. 7986	5.8	0.76	1.0	5 30.0	18 59.9	- 7 52.6	-0.2972	0.5220	0.1641	+17	-52		
B. A. C. 7993	6.6	0.75	1.0	5 19.4	20 7.0	- 6 47.2	-0.3088	0.5219	0.1646	+16	-53		
B. A. C. 8017	6.1	0.73	1.2	5 13.7	22 21.6	- 4 35.6	-0.0435	0.5216	0.1655	+31	-37		
B. A. C. 8094	5.6	0.66	1.5	4 1.2	21 5 48.5	+ 2 37.4	-0.1398	0.5212	0.1682	+25	-42		
11 Piscium	6.5	-0.59	-1.7	- 2 19.2	13 10.5	+ 9 46.8	-0.7735	0.5209	+0.1702	- 9	-90		
13 Piscium	6.4	0.57	1.6	1 37.0	14 30.3	+11 4.3	-1.3249	0.5209	0.1706	-63	-90		
14 Piscium	5.9	0.56	1.7	1 46.7	15 39.7	-11 48.4	-0.9488	0.5209	0.1708	-21	-90		
W. B. xxiii, 1069	6.9	0.43	2.6	- 0 48.9	22 5 13.8	+ 1 22.3	+0.3229	0.5216	0.1727	+53	-16		
B. A. C. 57	7.0	0.32	2.8	+ 1 9.2	14 42.9	+10 34.9	-0.2060	0.5227	0.1729	+22	-46		
44 Piscium	5.8	-0.28	-2.8	+ 1 24.4	18 42.5	- 9 32.4	+0.2095	0.5232	+0.1727	+46	-22		
B. A. C. 167	7.5	0.20	3.2	2 35.8	23 1 52.4	- 2 35.0	+0.1404	0.5249	0.1719	+42	-26		
B. A. C. 237	6.7	0.14	3.7	2 51.8	8 10.9	+ 3 32.0	+0.9287	0.5265	0.1706	+90	+20		
B. A. C. 243	7.3	0.12	3.5	3 33.9	9 13.6	+ 4 33.2	+0.3411	0.5268	0.1704	+55	-15		
73 Piscium	6.4	0.04	3.5	5 8.4	15 9.3	+10 18.4	-0.3698	0.5286	0.1687	+14	-56		
77 Piscium	6.1	-0.04	-3.8	+ 4 23.8	15 38.5	+10 46.7	+0.5220	0.5288	+0.1686	+68	- 5		
$\epsilon$ Piscium	5.7	-0.03	3.6	5 8.5	16 57.5	-11 56.6	-0.0664	0.5293	0.1682	+30	-37		
88 Piscium	6.2	+0.02	3.4	6 29.2	20 10.1	- 8 49.8	-0.9895	0.5304	0.1670	-24	-84		
B. A. C. 410	7.4	0.07	3.6	6 54.5	24 0 20.3	- 4 47.1	-0.7525	0.5319	0.1654	- 8	-78		
96 Piscium	6.6	0.11	3.9	6 47.8	3 25.6	- 1 47.4	-0.1227	0.5332	0.1640	+27	-40		
$\mu$ Piscium	5.2	+0.10	-4.3	+ 5 38.9	3 59.3	- 1 14.8	+1.2125	0.5334	+0.1637	+90	+45		

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

THE STARS					AT CONJUNCTION IN R. A.								Limiting Parallels.	
Name.	Mag.	Red'ns from 1904.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.			
		$\Delta\alpha$	$\Delta\delta$											
		s	"	°	d	h	m	h	m			°	°	
$\epsilon$ Piscium	4.4	+0.21	-4.0	+8 40.4	24	11	34.6	+6 6.6	-0.8268	0.5368	+0.1598	-12	-81	
$\xi$ Arietis	5.4	0.44	5.0	10 10.5	25	6	46.9	+0 42.7	+0.5149	0.5468	0.1464	+68	-2	
B. A. C. 755	7.0	0.45	5.1	10 7.9	7	42.6	+1 36.7	+0.6952	0.5474	0.1456	+89	+8		
25 Arietis	7.3	0.45	5.3	9 46.2	8	1.9	+1 55.3	+1.1266	0.5476	0.1453	+90	+39		
31 Arietis	5.6	0.52	4.8	12 1.8	12	21.7	+6 6.7	-0.6555	0.5502	0.1415	-3	-74		
38 Arietis	5.2	+0.57	-5.1	+12 2.4	16	17.2	+9 54.6	-0.1176	0.5526	+0.1378	+27	-36		
W. B. ii, 1033	5.9	0.69	5.7	12 49.0	26	2	12.4	-4 30.0	+0.3797	0.5590	0.1274	+58	-7	
B. A. C. 987	6.3	0.70	5.9	12 40.9	4	28.7	-2 18.4	+0.8059	0.5606	0.1248	+90	+18		
B. A. C. 1272	6.3	1.03	6.8	17 4.9	27	5	26.0	-2 13.4	-1.0633	0.5778	0.0910	-30	-73	
W.B.(2),iv, 59	6.4	1.05	7.0	17 1.7	7	22.2	-0 21.4	-0.8341	0.5792	0.0880	-14	-73		
48 Tauri	6.4	+1.05	-7.6	+15 9.5	8	46.9	+1 0.2	+1.2165	0.5802	+0.0857	+90	+56		
$\gamma$ Tauri	3.9	1.07	7.7	15 23.6	10	29.3	+2 38.9	+1.1169	0.5813	0.0830	+90	+46		
55 Tauri	7.3	1.08	7.5	16 17.3	10	31.5	+2 41.0	+0.1985	0.5813	0.0829	+46	-12		
$\delta^1$ Tauri	4.0	1.11	7.3	17 18.9	11	47.3	+3 54.0	-0.7540	0.5822	0.0808	-9	-73		
63 Tauri	5.6	1.10	7.5	16 33.1	12	0.3	+4 6.6	+0.0497	0.5823	0.0805	+37	-20		
$\delta^2$ Tauri	4.7	+1.11	-7.4	+17 13.2	12	16.9	+4 22.5	-0.6154	0.5825	+0.0800	-1	-64		
$\delta^3$ Tauri	4.2	1.12	7.2	17 42.4	12	51.6	+4 55.9	-1.0696	0.5831	0.0791	-33	-72		
70 Tauri	6.3	1.10	7.8	15 43.2	12	56.9	+5 1.0	+0.9793	0.5831	0.0789	+90	+35		
75 Tauri	5.3	1.12	7.8	16 8.6	14	8.0	+6 9.5	+0.6359	0.5838	0.0769	+82	+13		
$\theta^1$ Tauri	3.9	1.11	8.0	15 44.8	14	11.4	+6 12.8	+1.0469	0.5838	0.0769	+90	+41		
B. A. C. 1391	5.0	+1.12	-8.0	+15 59.0	15	1.3	+7 0.9	+0.8673	0.5844	+0.0755	+90	+28		
B. A. C. 1394	7.5	1.13	8.0	15 56.3	15	6.8	+7 6.2	+0.9195	0.5845	0.0753	+90	+31		
85 Tauri	6.5	1.13	7.8	15 38.6	15	34.4	+7 32.8	+1.2567	0.5848	0.0745	+90	+65		
B. A. C. 1406	7.5	1.14	8.0	16 7.1	16	18.7	+8 15.4	+0.8235	0.5853	0.0733	+90	+25		
$\alpha$ Tauri	1.0	1.15	8.1	16 18.9	17	15.7	+9 10.3	+0.6913	0.5859	0.0716	+90	+17		
89 Tauri	6.5	+1.16	-8.3	+15 50.3	18	12.2	+10 4.7	+1.2442	0.5865	+0.0700	+90	+63		
B. A. C. 1526	5.8	1.25	8.4	17 0.0	28	2	7.7	-6 17.6	+0.5521	0.5917	0.0559	+73	+10	
104 Tauri	5.1	1.30	8.6	18 30.8	6	11.7	-2 22.9	-0.7752	0.5942	0.0481	-11	-71		
111 Tauri	5.2	1.35	9.5	17 17.5	13	5.0	+4 14.6	+0.7484	0.5982	0.0347	+90	+25		
115 Tauri	5.4	1.36	9.5	17 52.7	14	11.2	+5 18.2	+0.1935	0.5988	0.0325	+45	-8		
117 Tauri	6.3	+1.36	-9.7	+17 9.4	14	32.4	+5 38.5	+0.9328	0.5990	+0.0318	+90	+36		
W. B. (2), v, 606	7.0	1.38	9.4	18 17.1	15	2.4	+6 7.4	-0.1911	0.5992	0.0308	+23	-29		
119 Tauri	4.6	1.39	9.5	18 31.2	16	11.5	+7 13.8	-0.3939	0.5999	0.0285	+12	-42		
120 Tauri	5.3	1.39	9.5	18 28.2	16	43.1	+7 44.2	-0.3278	0.6002	0.0275	+16	-37		
122 Tauri	5.4	1.39	10.0	16 58.7	18	9.0	+9 6.7	+1.2118	0.6009	0.0245	+90	+62		
B. A. C. 1796	7.5	+1.43	-9.7	+18 56.2	20	16.3	+11 9.0	-0.7131	0.6020	+0.0202	-7	-70		
127 Tauri	6.3	1.43	9.7	18 55.8	20	26.2	+11 18.5	-0.7030	0.6021	0.0199	-6	-68		
130 Tauri	5.5	1.43	10.2	17 41.4	22	15.3	-10 56.7	+0.5765	0.6035	+0.0166	+56	+16		
71 Orionis	5.1	1.52	10.7	19 11.2	29	8	59.8	-0 37.8	-0.8682	0.6076	-0.0065	-17	-71	
20 Geminorum	6.3	1.55	11.5	17 50.7	15	47.6	+5 53.6	+0.3761	0.6099	0.0211	+58	+4		
21 Geminorum	6.5	+1.55	-11.5	+17 51.0	15	47.9	+5 53.9	+0.3710	0.6099	-0.0211	+58	+4		
26 Geminorum	5.1	1.57	11.8	17 44.2	19	42.1	+9 38.7	+0.3837	0.6109	0.0295	+59	+4		
W. B. (2), vi, 1630	6.2	1.60	12.3	17 53.3	30	3	24.8	-6 57.4	-0.0597	0.6122	0.0462	+31	-23	
51 Geminorum	5.4	1.61	12.7	16 19.1	7	38.5	-2 54.0	+1.2750	0.6131	0.0552	+90	+71		
$\lambda$ Geminorum	3.6	1.62	12.8	16 42.6	9	27.0	-1 9.9	+0.7858	0.6132	0.0591	+90	+25		
B. A. C. 2432	7.0	+1.63	-12.7	+18 27.3	11	20.2	+0 38.7	-1.0494	0.6134	-0.0631	-31	-72		
W. B. (2), vii, 685	5.6	1.64	13.0	17 17.2	14	41.8	+3 52.0	-0.1234	0.6135	0.0701	+27	-28		
68 Geminorum	5.0	1.63	13.2	16 1.8	15	24.5	+4 33.0	+1.0632	0.6135	0.0716	+90	+43		
$f$ Geminorum	5.2	1.64	13.1	17 53.4	17	37.9	+6 40.9	-0.9302	0.6136	0.0762	-21	-72		
1 Cancri	5.9	1.65	13.5	16 2.6	31	0	22.8	-10 50.7	+0.3229	0.6133	0.0899	+54	-6	
B. A. C. 2649	6.3	+1.65	-13.5	+16 46.4	0	57.5	-10 17.4	-0.4459	0.6132	-0.0910	+9	-51		
5 Cancri	6.4	1.65	13.5	16 43.0	2	6.2	-9 11.6	-0.4952	0.6131	0.0933	+7	-55		
29 Cancri	5.9	1.65	13.9	14 31.5	12	34.9	+0 51.7	+0.5670	0.6114	0.1132	+74	+6		
B. A. C. 2872	6.8	+1.64	-13.9	+13 34.9	14	27.0	+2 39.3	+1.2732	0.6110	-0.1165	+85	+64		

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

THE STAR'S				AT CONJUNCTION IN R. A.							Limiting Parallels.	
Name.	Mag.	Red'ns from 1904.0.		Apparent Declination.	Washington Mean Time.	Hour Angle. //	y'	x'	y'	N.	S.	
		$\Delta\alpha$	$\Delta\delta$									
		s	"	°	d h m	h m				°	°	
B. A. C. 3122	7.0	+1.62	-13.9	+11 57.1	1 4 37.9	- 7 43.9	+1.0406	0.6068	-0.1400	+90	+34	
$\xi$ Leonis	5.2	1.60	13.8	11 43.3	13 22.8	+ 0 40.2	-0.0152	0.6037	0.1525	+34	-30	
$\theta$ Leonis	3.8	1.58	13.6	10 19.5	17 3.1	+ 4 11.8	+0.7793	0.6024	0.1573	+90	+14	
B. A. C. 3398	6.0	1.56	13.4	9 23.1	23 10.2	+10 4.6	+0.7146	0.5996	0.1645	+90	+ 9	
$\pi$ Sextantis	6.0	1.56	13.3	8 46.1	23 51.1	+10 43.9	+1.2044	0.5994	0.1653	+90	+46	
A Leonis	4.6	+1.53	-13.3	+10 27.9	2 3 47.0	- 9 29.3	-1.1120	0.5976	-0.1693	-34	-80	
B. A. C. 3538	7.0	1.51	13.0	9 26.7	9 36.5	- 3 53.2	-1.1181	0.5951	0.1748	-34	-81	
43 Leonis	6.5	1.51	12.6	7 1.6	9 56.3	- 3 34.2	+1.1934	0.5951	0.1751	+90	+44	
44 Leonis	6.2	1.49	12.9	9 16.2	10 50.4	- 2 42.1	-1.1625	0.5915	0.1758	-38	-81	
48 Leonis	5.2	1.48	12.4	7 26.7	14 45.9	+ 1 4.3	-0.0702	0.5928	0.1789	+30	-36	
37 Sextantis	6.2	+1.46	-12.1	+ 6 52.6	19 25.1	+ 5 33.1	-0.3525	0.5907	-0.1821	+15	-54	
56 Leonis	6.6	1.43	11.8	6 41.7	23 32.4	+ 9 31.1	-0.9311	0.5888	0.1845	-19	-83	
$\alpha$ Leonis	5.0	1.44	11.3	4 7.8	3 1 26.2	+11 20.6	+1.2423	0.5879	0.1855	+90	+48	
82 Leonis	6.9	1.36	10.4	3 49.6	11 59.1	- 2 29.8	-0.4363	0.5834	0.1894	+10	-61	
83 Leonis	6.1	1.35	10.3	3 32.0	12 28.8	- 2 1.2	-0.2398	0.5831	0.1895	+21	-48	
$\tau$ Leonis	5.1	+1.36	-10.2	+ 3 22.9	12 56.9	- 1 34.2	-0.1789	0.5830	-0.1896	-24	-44	
W. B., xi, 349	5.1	1.36	10.2	3 21.4	12 57.3	- 1 33.8	-0.1549	0.5830	0.1896	+25	-43	
89 Leonis	6.2	1.33	10.1	3 35.4	15 41.2	+ 1 4.1	-0.9063	0.5819	0.1902	-18	-86	
$\beta$ Virginis	3.7	1.29	9.2	+ 2 28.2	22 37.5	+ 7 45.3	-0.9540	0.5790	0.1908	-21	-88	
13 Virginis	6.3	1.21	7.6	- 0 15.3	4 10 45.1	- 4 33.1	-0.7161	0.5746	0.1895	- 6	-90	
$\gamma$ Virginis	4.1	+1.21	- 7.5	- 0 8.1	11 17.6	- 4 1.7	-0.9395	0.5741	-0.1894	-20	-90	
38 Virginis	6.2	1.09	5.4	3 2.0	5 1 54.3	+10 4.0	-0.7654	0.5698	0.1839	- 9	-90	
$\delta$ Virginis	5.9	1.07	5.4	3 17.8	4 45.5	-11 10.7	-1.0243	0.5690	0.1824	-26	-90	
51 Virginis	4.4	1.03	4.1	5 1.7	9 19.1	- 6 46.7	-0.0958	0.5678	0.1797	+28	-40	
$\lambda$ Virginis	6.1	0.95	2.9	5 58.5	18 27.0	+ 2 2.4	-0.7466	0.5657	0.1733	- 9	-90	
$\mu$ Virginis	4.9	+0.95	- 2.9	- 5 45.7	19 8.8	+ 2 42.7	-1.0866	0.5654	-0.1727	-33	-90	
77 Virginis	7.0	0.95	2.4	7 7.8	19 47.4	+ 3 20.0	+0.2015	0.5654	0.1723	+44	-23	
81 Virginis	7.0	0.93	2.2	7 23.0	21 39.1	+ 5 7.8	+0.1406	0.5650	0.1708	+40	-26	
82 Virginis	5.3	0.91	1.8	5 13.2	23 27.5	+ 6 52.5	+0.6906	0.5646	0.1693	+81	+ 4	
B. A. C. 4591	6.3	0.90	1.1	9 13.7	6 1 58.1	+ 9 17.9	+1.3054	0.5642	0.1671	+81	+59	
B. A. C. 4647	6.4	+0.85	- 1.3	- 7 35.2	5 28.7	-11 18.6	-0.9629	0.5636	-0.1639	-24	-90	
94 Virginis	6.8	0.80	0.6	8 26.0	10 34.5	- 6 23.3	-0.9162	0.5627	0.1590	-21	-90	
95 Virginis	5.7	0.81	- 0.1	8 51.3	10 46.0	- 6 12.1	-0.5115	0.5627	0.1589	+ 3	-68	
96 Virginis	6.5	0.80	0.0	9 52.8	11 47.4	- 5 12.9	+0.3847	0.5625	0.1578	+55	-13	
$\kappa$ Virginis	4.3	0.78	+ 0.2	9 49.6	13 32.8	- 3 31.0	+0.0545	0.5623	0.1560	+34	-31	
2 Libræ	6.3	+0.74	+ 1.1	-11 16.5	18 18.2	+ 1 4.6	+0.8261	0.5616	-0.1510	+79	+13	
B. A. C. 4772	6.6	0.73	1.1	11 14.0	18 52.6	+ 1 37.9	+0.6970	0.5616	0.1504	+78	+ 5	
B. A. C. 4828	6.0	0.67	1.8	11 53.8	7 0 30.0	+ 7 3.8	+0.5608	0.5610	0.1440	+66	- 3	
$\zeta$ Libræ	5.9	0.58	2.3	11 30.4	8 22.7	- 9 19.5	-0.9463	0.5602	0.1346	-26	-90	
$\epsilon$ Libræ	6.3	0.45	4.4	14 47.4	21 24.8	+ 3 16.2	+0.8610	0.5592	0.1177	+75	+16	
$\gamma$ Libræ	4.0	+0.39	+ 4.7	-14 28.1	8 3 8.1	+ 8 48.0	-0.1292	0.5589	-0.1098	+19	-42	
B. A. C. 5188	6.6	0.34	5.3	14 44.0	6 45.0	-11 42.3	-0.2353	0.5586	0.1046	+12	-48	
$\eta$ Libræ	5.5	0.34	5.2	15 22.0	7 2.5	-11 25.4	+0.4053	0.5586	0.1042	+50	+12	
$\theta$ Libræ	4.3	0.29	5.9	16 26.8	11 29.6	- 7 7.3	+1.1061	0.5584	0.0978	+74	+36	
49 Libræ	5.6	0.24	5.8	16 15.0	14 31.0	- 4 11.9	+0.6076	0.5582	0.0933	+64	+ 1	
$\phi$ Ophiuchi	4.4	+0.08	+ 6.7	-16 24.1	9 4 39.7	+ 9 28.0	-0.3970	0.5572	-0.0719	0	-60	
24 Scorpii	5.2	+0.03	7.2	17 33.3	9 27.2	- 9 53.7	+0.5169	0.5572	0.0644	+54	- 5	
B. A. C. 5695	6.2	-0.05	7.1	16 39.1	16 8.6	- 3 25.7	-0.8533	0.5566	0.0538	-29	-90	
B. A. C. 5771	6.2	0.11	7.5	17 28.8	21 47.5	+ 2 1.9	-0.2372	0.5563	0.0448	+ 7	-49	
B. A. C. 5839	6.0	0.18	7.6	17 39.2	10 3 11.5	+ 7 15.1	-0.2675	0.5558	0.0361	+ 4	-51	
B. A. C. 6060	6.5	-0.36	+ 8.0	-18 47.0	19 58.4	- 0 31.2	+0.5852	0.5540	-0.0089	+55	- 1	
B. A. C. 6086	6.1	0.38	7.5	17 9.1	22 34.0	+ 1 59.3	-1.2172	0.5536	-0.0048	-64	-90	
B. A. C. 6201	7.3	0.47	7.8	18 39.3	11 6 41.3	+ 9 50.7	+0.4417	0.5526	+0.0083	+43	- 9	
Y Sagittarii	Var.	0.49	7.8	18 54.1	7 56.4	+11 3.4	+0.7244	0.5524	0.0102	+71	+ 7	
B. A. C. 6267	6.7	0.51	7.5	17 51.4	11 3.5	- 9 55.6	-0.3818	0.5518	0.0152	- 5	-59	
B. A. C. 6287	6.0	-0.53	+ 7.7	-18 47.2	12 6.3	- 8 54.8	+0.6572	0.5517	+0.0168	+63	+ 4	

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1904.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	$\lambda'$	$\alpha'$	$\gamma'$	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
B. A. C. 6294	5.2	-0.53	+7.6	-18 28.0	11 12 42.1	- 8 20.2	+0.3151	0.5517	+0.0178	+35	-17
<sup>11</sup> Sagittarii	3.9	0.73	6.6	18 1.6	12 12 42.6	- 9 6.1	+0.7062	0.5471	0.0545	+69	+ 7
<sup>12</sup> Sagittarii	6.1	0.73	6.7	18 29.1	12 46.7	- 9 2.1	+1.2166	0.5471	0.0547	+71	+51
<sup>13</sup> Sagittarii	5.6	0.77	5.8	16 30.7	21 57.8	- 0 8.6	-0.4023	0.5451	0.0678	0	-60
<sup>14</sup> Sagittarii	5.0	0.78	5.8	16 20.9	22 50.4	+ 0 42.5	-0.5245	0.5448	0.0691	- 7	-70
B. A. C. 6746	5.5	-0.77	+5.6	-15 41.4	23 21.1	+ 1 12.2	-1.2169	0.5447	+0.0698	-58	-90
<sup>15</sup> Sagittarii	5.0	0.82	5.2	15 44.7	13 6 23.7	+ 8 1.5	-0.6316	0.5432	0.0795	-12	-82
B. A. C. 6992	6.2	0.86	4.5	15 5.2	17 39.6	- 5 3.6	-0.3835	0.5405	0.0942	+ 4	-59
<sup>16</sup> Capricorni	3.4	0.87	4.4	15 5.0	17 46.6	- 4 56.8	-0.3759	0.5405	0.0943	+ 4	-58
B. A. C. 7009	7.0	0.87	4.2	14 33.8	18 59.5	- 3 46.2	-0.8380	0.5401	0.0959	-23	-90
Lalande 39247	7.4	-0.88	+4.2	-15 17.5	20 17.4	- 2 30.6	+0.0968	0.5398	+0.0975	+31	-28
B. A. C. 7087	6.2	0.88	+3.8	14 3.1	14 0 21.1	+ 1 25.6	-0.8740	0.5388	0.1024	-24	-90
NEW MOON.											
11 Piscium	6.5	0.72	-2.9	- 2 19.2	17 19 7.3	- 6 29.0	-0.9012	0.5234	0.1697	-18	-90
14 Piscium	5.9	-0.71	-3.0	- 1 46.7	21 36.0	- 4 4.6	-1.0795	0.5234	+0.1702	-31	-90
MARS				3 13.1	18 1 57.6	+ 0 9.5	+1.2596	0.4908	0.1567	+87	+50
JUPITER				2 1.8	9 50.8	+ 7 50.0	+1.3000	0.5139	0.1680	+88	+56
W.B.xxiii, 1069	6.9	0.63	3.9	- 0 48.9	11 7.9	+ 9 3.8	+0.1763	0.5237	0.1722	+44	-24
B. A. C. 57	7.0	0.56	4.3	+ 1 9.2	20 36.3	- 5 44.2	-0.3616	0.5244	0.1724	+14	-56
44 Piscium	5.8	-0.54	-4.5	+ 1 24.4	19 0 36.1	- 1 51.4	+0.0484	0.5249	+0.1721	+37	-31
B. A. C. 167	7.5	0.47	4.8	2 35.8	7 46.5	+ 5 6.5	-0.0278	0.5259	0.1712	+32	-35
B. A. C. 237	6.7	0.43	5.2	2 51.8	14 6.1	+11 14.9	+0.7587	0.5271	0.1699	+90	+ 9
B. A. C. 243	7.3	0.42	5.1	3 33.9	15 9.0	-11 44.0	+0.1676	0.5273	0.1697	+44	-24
73 Piscium	6.4	0.36	5.2	5 8.4	21 6.4	- 5 57.1	-0.5517	0.5286	0.1679	+ 4	-70
77 Piscium	6.1	-0.36	-5.4	+ 4 23.7	21 35.8	- 5 28.6	+0.3450	0.5287	+0.1678	+55	-14
<sup>17</sup> Piscium	5.7	0.35	5.3	5 8.4	22 55.3	- 4 11.4	-0.2474	0.5290	0.1673	+20	-48
88 Piscium	6.2	0.31	5.2	6 29.2	20 2 9.1	- 1 3.3	-1.1783	0.5299	0.1661	-40	-84
B. A. C. 410	7.4	0.27	5.4	6 54.5	6 21.3	+ 3 1.3	-0.9426	0.5311	0.1644	-20	-83
96 Piscium	6.6	0.25	5.6	6 47.8	9 28.3	+ 6 2.8	-0.3103	0.5320	0.1630	+17	-51
$\mu$ Piscium	5.2	-0.25	-6.0	+ 5 38.8	10 2.2	+ 6 35.6	+1.0336	0.5322	+0.1627	+90	+28
$\sigma$ Piscium	4.4	-0.16	5.8	8 40.4	17 42.4	- 9 58.1	-1.0234	0.5342	0.1586	-27	-81
$\xi$ Arietis	5.4	+0.03	6.6	10 10.4	21 13 12.6	+ 8 55.9	+0.3255	0.5426	0.1450	+54	-12
B. A. C. 755	7.0	0.04	6.7	10 7.9	14 9.4	+ 9 51.0	+0.5078	0.5430	0.1442	+68	- 2
25 Arietis	7.3	0.03	6.8	9 46.2	14 29.0	+10 9.9	+0.9436	0.5432	0.1439	+90	+25
31 Arietis	5.6	+0.10	-6.4	+12 1.8	18 54.2	- 9 33.3	-0.8574	0.5452	+0.1401	-15	-78
38 Arietis	5.2	0.14	6.7	12 2.4	22 54.7	- 5 40.4	-0.3134	0.5471	0.1364	+16	-48
W. B. ii, 1033	5.9	0.25	7.2	12 48.9	22 9 4.3	+ 4 9.4	+0.1917	0.5524	0.1259	+45	-17
B. A. C. 987	6.3	0.27	7.3	12 40.9	11 24.2	+ 6 24.7	+0.6244	0.5536	0.1234	+80	+ 7
B. A. C. 1272	6.3	0.59	7.7	17 4.9	23 13 7.2	+ 7 15.6	-1.2605	0.5681	0.0898	-57	-73
W.B. (2) iv, 59	6.4	+0.62	-7.9	+17 1.7	15 7.4	+ 9 11.6	-1.0267	0.5693	+0.0871	-29	-73
48 Tauri	6.4	0.62	8.6	15 9.5	16 35.1	+10 36.3	+1.0582	0.5701	0.0847	+90	+41
$\gamma$ Tauri	3.9	0.64	8.7	15 23.6	18 20.9	-11 41.7	+0.9577	0.5712	0.0820	+90	+33
55 Tauri	7.3	0.65	8.4	16 17.3	18 23.2	-11 39.5	+0.0245	0.5712	0.0819	+35	-22
$\delta$ Tauri	4.0	0.67	8.1	17 18.9	19 41.7	-10 23.7	-0.9424	0.5719	0.0799	-22	-73
63 Tauri	5.6	+0.67	-8.4	+16 33.1	19 55.2	-10 10.7	-0.1255	0.5721	+0.0796	+28	-30
$\beta$ Tauri	4.7	0.68	8.2	17 13.2	20 12.3	- 9 54.3	-0.8014	0.5723	0.0792	-13	-73
$\theta$ Tauri	4.2	0.69	8.0	17 42.4	20 48.3	- 9 19.5	-1.2624	0.5726	0.0782	-59	-72
70 Tauri	6.3	0.67	8.7	15 43.2	20 53.8	- 9 14.2	+0.8198	0.5726	0.0781	+90	+24
71 Tauri	6.0	0.67	8.9	15 23.9	21 13.0	- 8 55.7	+1.1802	0.5728	0.0776	+90	+53
75 Tauri	5.3	+0.69	-8.7	+16 8.6	22 7.4	- 8 3.2	+0.4719	0.5734	+0.0761	+66	+ 4
$\theta$ Tauri	3.9	0.69	8.8	15 44.8	22 11.0	- 7 59.7	+0.8897	0.5734	0.0761	+90	+28
80 Tauri	5.6	0.69	9.0	15 25.6	22 52.3	- 7 19.9	+1.2759	0.5738	0.0750	+90	+69
B. A. C. 1391	5.0	0.70	8.8	15 59.0	23 2.6	- 7 10.0	+0.7078	0.5739	0.0747	+90	+17
81 Tauri	5.5	0.69	9.0	15 28.8	23 5.4	- 7 7.3	+1.2350	0.5739	0.0746	+90	+61
B. A. C. 1394	7.5	+0.70	-8.8	+15 56.3	23 8.3	- 7 4.5	+0.7610	0.5740	+0.0745	+90	+21

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

THE STAR'S					AT CONJUNCTION IN R. A.								Limiting Parallels.	
Name.	Mag.	Red'ns from 1904.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.			
		$\Delta\alpha$	$\Delta\delta$											
		$\alpha$	$\delta$	$\alpha$	d h m	h m				$\alpha$	$\delta$			
85 Tauri	6.5	+0.70	-9.0	+15 38.6	23 23 37.0	-6 36.8	+1.1043	0.5742	+0.0737	+90	+46			
B. A. C. 1406	7.5	0.71	8.8	16 7.1	24 0 22.8	-5 52.7	+0.6641	0.5746	0.0725	+86	+15			
a Tauri	1.0	0.73	8.9	16 18.8	1 21.9	-4 55.7	+0.5308	0.5752	0.0709	+71	+8			
89 Tauri	6.5	0.73	9.1	15 50.3	2 20.3	-3 59.4	+1.0935	0.5758	0.0693	+90	+45			
o Tauri	4.8	0.74	9.1	15 43.5	2 49.5	-3 31.2	+1.2446	0.5760	0.0685	+90	+63			
B. A. C. 1526	5.8	+0.84	-9.2	+17 0.0	10 33.7	+3 56.2	+0.3980	0.5804	+0.0554	+60	+2			
104 Tauri	5.1	0.89	9.0	18 30.8	14 46.8	+8 0.1	-0.9492	0.5827	0.0479	-23	-71			
111 Tauri	5.2	0.97	9.9	17 17.5	21 56.0	-9 6.6	+0.6074	0.5865	0.0349	+79	+16			
115 Tauri	5.4	0.98	9.8	17 52.7	23 4.6	-8 0.6	+0.0440	0.5870	0.0328	+36	-16			
117 Tauri	6.3	0.98	10.1	17 9.4	23 26.7	-7 39.3	+0.7968	0.5872	0.0321	+90	+28			
W.B.(2),v,606	7.0	+1.00	-9.7	+18 17.1	23 58.0	-7 9.2	-0.3460	0.5874	+0.0311	+14	-39			
119 Tauri	4.6	1.01	9.7	18 31.2	25 1 9.7	-6 0.1	-0.5512	0.5882	0.0289	+2	-54			
120 Tauri	5.3	1.02	9.8	18 28.2	1 42.5	-5 28.5	-0.4833	0.5883	0.0278	+7	-48			
122 Tauri	5.4	1.04	10.4	16 58.7	3 11.7	-4 2.7	+1.0840	0.5891	0.0250	+90	+49			
B. A. C. 1796	7.5	1.06	9.8	18 56.2	5 23.8	-1 55.5	-0.8713	0.5902	0.0208	-18	-71			
127 Tauri	6.3	+1.06	-9.9	+18 55.8	5 34.1	-1 45.7	-0.8608	0.5902	+0.0204	-17	-71			
130 Tauri	5.5	1.07	10.4	17 41.4	7 27.4	+0 3.3	+0.4425	0.5911	+0.0168	+63	+8			
71 Orionis	5.1	1.20	10.6	19 11.2	18 36.2	+10 46.7	-1.0135	0.5959	-0.0053	-29	-71			
20 Geminorum	6.3	1.26	11.5	17 50.7	26 1 39.0	-6 26.9	+0.2596	0.5981	0.0195	+50	-2			
21 Geminorum	6.5	1.26	11.5	17 51.0	1 39.3	-6 26.6	+0.2544	0.5984	0.0195	+50	-3			
23 Geminorum	7.1	+1.27	-11.9	+16 52.3	3 10.0	-4 59.5	+1.2089	0.5989	-0.0226	+90	+62			
26 Geminorum	5.1	1.30	11.7	17 44.2	5 42.1	-2 33.3	+0.2722	0.5997	0.0278	+51	-3			
W.B.(2),vi,1630	6.2	1.38	12.1	17 53.3	13 40.4	+5 6.3	-0.1676	0.6019	0.0440	+24	-29			
51 Geminorum	5.4	1.40	12.8	16 19.1	18 2.3	+9 17.9	+1.1921	0.6029	0.0529	+90	+57			
2 Geminorum	3.6	1.42	12.7	16 42.6	19 54.3	+11 5.5	+0.6971	0.6033	0.0567	+90	+19			
B. A. C. 2432	7.0	+1.44	-12.4	+18 27.3	21 50.9	-11 2.5	-1.1592	0.6036	-0.0607	-42	72			
W.B.(2),vii,685	5.6	1.47	12.8	17 17.2	27 1 18.6	-7 43.0	-0.2156	0.6040	0.0676	+22	-34			
67 Geminorum	7.5	1.47	13.2	15 50.5	1 58.1	-7 5.0	+1.1796	0.6041	0.0689	+90	+54			
68 Geminorum	5.0	1.47	13.2	16 1.8	2 2.6	-7 0.7	+0.9873	0.6042	0.0691	+90	+37			
f Geminorum	5.2	1.49	12.9	17 53.4	4 19.8	-4 48.9	-1.0282	0.6044	0.0736	-29	-72			
1 Cancri	5.9	+1.54	-13.5	+16 2.6	11 15.5	+1 50.2	+0.2505	0.6051	-0.0872	+49	-10			
B. A. C. 2649	6.3	1.54	13.4	16 46.4	11 51.1	+2 24.4	-0.5260	0.6051	0.0883	+4	-57			
5 Cancri	6.4	1.55	13.4	16 43.0	13 1.6	+3 31.8	-0.5742	0.6051	0.0906	+2	-61			
29 Cancri	5.9	1.61	14.2	14 31.5	23 44.2	-10 10.7	+0.5140	0.6051	0.1104	+69	+3			
B. A. C. 2872	6.8	1.62	14.4	13 34.9	28 1 38.4	-8 21.0	+1.2303	0.6050	0.1138	+90	+56			
B. A. C. 3122	7.0	+1.69	-14.7	+11 57.1	16 2.1	+5 28.6	+1.0145	0.6034	-0.1376	+90	+32			
5 Leonis	5.2	1.71	14.7	11 43.3	29 0 51.6	-10 2.8	-0.0322	0.6019	0.1504	+32	-31			
o Leonis	3.8	1.72	14.7	10 19.5	4 33.1	-6 30.0	+0.7701	0.6010	0.1553	+90	+14			
B. A. C. 3398	6.0	1.74	14.7	9 23.0	10 41.1	-0 35.1	+0.7142	0.5997	0.1629	+90	+9			
11 Sextantis	6.0	1.74	14.7	8 46.1	11 22.1	+0 3.2	+1.2052	0.5995	0.1637	+90	+46			
A Leonis	4.6	+1.74	-14.5	+10 27.9	15 17.9	+3 49.9	-1.1055	0.5985	-0.1680	-33	-80			
B. A. C. 3538	7.0	1.75	14.4	9 26.7	21 6.2	+9 24.8	-1.1077	0.5970	0.1738	-33	-81			
43 Leonis	6.5	1.76	14.5	7 1.5	21 25.9	+9 42.5	+1.2072	0.5969	0.1741	+90	+46			
44 Leonis	6.2	+1.75	-14.2	+9 16.2	22 19.6	+10 35.4	-1.1425	0.5967	-0.1749	-37	-81			

MARCH.

48 Leonis	5.2	+1.76	-14.2	+7 26.6	1	2	13.6	-9	39.5	-0.0480	0.5956	-0.1782	+31	-33
37 Sextantis	6.2	1.76	14.0	6 52.5			6 50.3	-5	13.4	-0.3204	0.5943	0.1817	+16	-52
56 Leonis	6.6	1.76	13.8	6 41.6			10 54.8	-1	18.1	-0.8895	0.5932	0.1844	-17	-83
d Leonis	5.0	+1.77	-13.6	+4 7.8			12 47.2	+0	30.0	+1.2753	0.5927	-0.1855	+90	+53
82 Leonis	6.9	1.76	12.9	3 49.6			23 10.1	+10	29.5	-0.3784	0.5897	0.1900	+13	-57
83 Leonis	6.1	1.75	12.9	3 32.0			23 39.2	+10	57.5	-0.1825	0.5896	0.1902	+24	-44
r Leonis	5.1	1.76	12.8	3 22.9	2	0	6.7	+11	23.9	-0.1212	0.5895	0.1903	+27	-41
W. B. vi, 349	5.1	1.76	12.8	3 21.3			0 7.1	+11	24.3	-0.0974	0.5895	0.1903	+28	-39
89 Leonis	6.2	+1.75	-12.7	+3 35.4			2 47.9	-10	0.9	-0.8389	0.5887	-0.1917	-13	-86

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1904.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m				"	"
$\beta$ Virginis	3.7	+1.75	-12.1	+ 2 18.1	2 9 35.1	- 3 28.8	-0.8753	0.5868	-0.1921	-16	-88
13 Virginis	6.3	1.72	11.0	- 0 15.4	21 24.7	+ 7 54.6	-0.6243	0.5837	0.1914	0	-78
$\eta$ Virginis	4.1	1.71	10.7	0 8.2	21 56.2	+ 8 25.0	-0.8440	0.5836	0.1913	-13	-90
38 Virginis	6.2	1.67	8.9	3 2.0	8 12 7.0	- 1 55.1	-0.6547	0.5804	0.1863	- 2	-82
$\kappa$ Virginis	5.9	1.67	8.4	3 17.8	14 52.8	+ 0 44.8	-0.9074	0.5791	0.1849	-18	-90
51 Virginis	4.4	+1.65	- 7.8	- 5 1.7	19 17.5	+ 4 59.9	+0.0121	0.5786	-0.1823	+34	-33
1 <sup>a</sup> Virginis	6.1	1.60	6.7	5 58.6	4 4 7.2	-10 29.4	-0.6218	0.5768	0.1760	- 2	-78
1 <sup>a</sup> Virginis	4.9	1.59	6.6	5 45.7	4 47.5	- 9 50.6	-0.9560	0.5766	0.1755	-23	-90
77 Virginis	7.0	1.60	6.3	7 7.9	5 24.3	- 9 15.1	+0.3145	0.5766	0.1750	+51	-16
81 Virginis	7.0	1.59	6.0	7 23.0	7 12.7	- 7 30.6	+0.2543	0.5762	0.1735	+47	-20
82 Virginis	5.3	+1.59	- 5.6	- 8 13.2	8 57.3	- 5 49.7	+0.7969	0.5758	-0.1719	+82	+11
B. A. C. 4647	6.4	1.54	5.1	7 35.3	14 46.0	- 0 13.5	-0.8265	0.5748	0.1666	-15	-90
94 Virginis	6.8	1.52	4.4	8 26.1	19 41.2	+ 4 31.4	-0.7777	0.5739	0.1617	-12	-90
95 Virginis	5.7	1.53	4.2	8 51.4	19 52.3	+ 4 42.0	-0.3794	0.5739	0.1615	+10	-58
96 Virginis	6.5	1.52	3.9	9 52.9	20 51.5	+ 5 39.2	+0.5031	0.5737	0.1605	+63	- 6
$\kappa$ Virginis	4.3	+1.50	- 3.7	- 9 49.7	22 33.3	+ 7 17.3	+0.1789	0.5734	-0.1586	+41	-24
2 Libræ	6.3	1.48	2.8	11 16.6	5 3 8.9	+11 43.2	+0.9402	0.5727	0.1535	+79	+21
B. A. C. 4772	6.6	1.47	2.7	11 14.1	3 42.1	-11 44.7	+0.8133	0.5726	0.1529	+79	+12
B. A. C. 4828	6.0	1.42	1.9	11 53.9	9 7.9	- 6 30.4	+0.6815	0.5717	0.1465	+76	+ 4
$\xi$ Libræ	5.9	1.35	- 1.2	11 30.4	16 44.7	+ 0 50.4	-0.7994	0.5705	0.1369	-16	-90
$\alpha$ Libræ	6.3	+1.27	+ 1.1	-14 47.5	6 5 21.7	-10 59.1	+0.9821	0.5686	-0.1196	+75	+25
$\gamma$ Libræ	4.0	1.19	1.6	14 28.2	10 54.6	- 5 37.8	+0.0071	0.5677	0.1115	+26	-34
B. A. C. 5188	6.6	1.17	2.2	14 44.1	14 25.1	- 2 14.6	-0.0974	0.5672	0.1063	-20	-40
$\eta$ Libræ	5.5	1.16	2.2	15 22.0	14 42.2	- 1 58.1	+0.5338	0.5672	0.1059	+60	- 4
$\theta$ Libræ	4.3	1.13	2.9	16 26.8	19 1.6	+ 2 12.4	+1.2244	0.5667	0.0993	+74	+50
49 Libræ	5.6	+1.08	+ 3.1	-16 15.0	21 58.1	+ 5 2.7	+0.7344	0.5661	-0.0948	+73	+ 8
$\phi$ Ophiuchi	4.4	0.92	4.3	16 24.2	7 11 45.6	- 5 38.3	-0.2599	0.5638	0.0730	+ 8	-50
24 Scorpæ	5.2	0.88	5.0	17 33.3	16 26.7	- 1 6.7	+0.6418	0.5630	0.0654	+65	+ 3
B. A. C. 5695	6.2	0.78	5.1	16 39.2	23 0.0	+ 5 13.2	-0.7148	0.5618	0.0547	-20	-90
B. A. C. 5771	6.2	0.72	5.7	17 28.8	8 4 32.5	+10 34.4	-0.1073	0.5607	0.0455	+14	-40
B. A. C. 5839	6.0	+0.65	+ 6.0	-17 39.3	9 51.0	- 8 17.8	-0.1395	0.5597	-0.0368	+12	-42
B. A. C. 6060	6.5	0.45	7.1	18 47.0	9 24.2	+ 7 42.1	+0.6087	0.5562	0.0093	+67	+ 6
B. A. C. 6086	6.1	0.41	6.6	17 9.1	4 58.3	+10 11.1	-1.0915	0.5556	-0.0053	-51	-90
B. A. C. 6201	7.3	0.32	7.3	18 39.3	13 1.2	- 6 1.9	+0.5518	0.5537	+0.0077	+52	- 2
Y Sagittarii	Var.	0.30	7.4	18 54.1	14 15.7	- 4 49.8	+0.8316	0.5534	0.0097	+71	+15
B. A. C. 6267	6.7	+0.26	+ 7.1	-17 51.4	17 21.5	- 1 50.1	-0.2695	0.5527	+0.0146	+ 2	-51
B. A. C. 6287	6.0	0.25	7.4	18 47.2	18 23.7	- 0 50.1	+0.7627	0.5524	0.0162	+71	+10
B. A. C. 6294	5.2	+0.25	7.3	18 28.0	18 59.3	- 0 15.6	+0.4223	0.5523	0.0172	+43	-10
$\rho$ Sagittarii	3.9	-0.04	7.2	18 1.6	10 18 54.5	- 1 6.7	+0.7975	0.5462	0.0537	+72	+13
$\epsilon$ Sagittarii	5.6	0.13	6.3	16 30.7	11 4 9.4	+ 7 50.6	-0.3137	0.5438	0.0669	+ 5	-54
$\iota$ Sagittarii	5.0	-0.14	+ 6.3	-16 20.9	5 2.0	+ 8 41.5	-0.4362	0.5435	+0.0682	- 2	-63
B. A. C. 6746	5.5	0.14	6.1	15 41.4	5 32.8	+ 9 11.3	-1.1271	0.5434	0.0689	-48	-90
$\kappa$ Sagittarii	5.0	0.21	5.9	15 44.7	12 35.3	- 7 59.4	-0.5490	0.5416	0.0785	- 7	-72
B. A. C. 6992	6.2	0.30	5.4	15 5.2	23 52.4	+ 2 56.6	-0.3101	0.5387	0.0931	+ 8	-53
$\beta$ Capricorni	3.4	0.31	5.3	15 5.0	23 59.4	+ 3 3.4	-0.3026	0.5387	0.0933	+ 8	-53
B. A. C. 7009	7.0	-0.32	+ 5.1	-14 33.8	12 1 12.5	+ 4 14.3	-0.7649	0.5384	+0.0948	-18	-90
Lalande 39247	7.4	0.33	5.2	15 17.5	2 30.5	+ 5 29.9	+0.1673	0.5381	0.0957	+35	-24
B. A. C. 7087	6.2	0.36	4.7	14 3.0	6 34.6	+ 9 26.6	-0.8077	0.5371	0.1013	-20	-90
$\tau$ Capricorni	7.0	0.38	5.0	15 28.7	8 8.3	+10 57.3	+0.9366	0.5367	0.1031	+75	+22
$\tau$ Capricorni	5.3	0.39	4.9	15 17.4	9 6.3	+11 53.6	+0.8283	0.5365	0.1043	+75	+14
8 Aquarii	6.8	-0.46	+ 3.9	-13 26.0	19 32.2	- 1 59.5	-0.0836	0.5342	+0.1160	+23	-39
9 Aquarii	7.0	0.47	4.0	13 54.3	20 8.9	- 1 23.9	+0.5106	0.5337	0.1167	+60	- 6
18 Aquarii	5.4	0.53	3.1	13 17.4	18 7 53.7	+ 9 59.7	+1.2696	0.5315	0.1286	+77	+55
$\iota$ Capricorni	6.2	0.57	1.7	9 43.1	19 17.6	- 2 56.7	-1.1734	0.5294	0.1390	-44	-90
$\lambda$ Capricorni	5.4	0.59	2.1	11 48.5	19 24.4	- 2 50.2	+1.1652	0.5294	0.1391	+78	+40
B. A. C. 7620	6.5	-0.60	+ 1.7	-10 45.8	23 4.3	+ 0 43.2	+0.5191	0.5288	+0.1421	+64	- 5

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

## MARCH.

THE STAR'S				AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1904.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, <i>H</i>	<i>l'</i>	<i>x'</i>	<i>y'</i>	N. S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m				
36 Aquarii	6.3	-0.62	+ 0.8	- 8 39.5	14 7 18.9	+ 8 43.2	-0.6227	0.5277	+0.1485	- 3 -79
<i>h</i> Aquarii	4.3	0.63	0.4	8 15.7	11 9.7	-11 32.8	-0.4861	0.5272	0.1512	+ 5 -66
B. A. C. 7774	6.2	0.64	0.6	9 31.1	11 11.1	-11 31.4	+0.9136	0.5272	0.1512	+80 +19
<i>p</i> Aquarii	5.4	0.64	0.3	8 18.2	12 55.4	- 9 50.0	-0.1721	0.5270	0.1524	+22 -44
B. A. C. 7804	6.2	0.64	+ 0.1	7 40.8	14 40.3	- 8 8.3	-0.5976	0.5268	0.1536	- 1 -76
W. B. xxii, 493	6.2	-0.64	- 0.2	- 7 2.7	18 43.5	- 4 12.2	-0.6742	0.5264	+0.1561	- 5 -85
NEW MOON.										
88 Piscium	6.2	0.51	6.2	+ 6 29.1	18 7 54.7	+ 6 29.6	-1.2073	0.5226	0.1668	-43 -84
B. A. C. 410	7.4	0.49	6.4	6 54.5	12 5.3	+10 32.7	-0.9735	0.5228	0.1650	-22 -83
96 Piscium	6.6	-0.47	- 6.6	+ 6 47.8	15 11.1	-10 27.1	-0.3427	0.5229	+0.1636	+15 -54
<i>μ</i> Piscium	5.2	0.48	6.8	5 38.8	15 44.3	- 9 54.9	+0.9987	0.5351	0.1633	+90 +25
<i>ν</i> Piscium	4.4	0.43	6.9	8 40.4	23 21.7	- 2 31.4	-1.0599	0.5377	0.1592	-30 -81
$\xi$ Arietis	5.4	0.31	7.8	10 10.4	19 18 47.4	- 7 41.9	+0.2852	0.5446	0.1453	+51 -15
B. A. C. 755	7.0	0.30	7.9	10 7.9	19 44.1	- 6 46.9	+0.4678	0.5450	0.1445	+64 - 5
25 Arietis	7.3	-0.31	- 8.0	+ 9 46.2	20 3.7	- 6 28.0	+0.9044	0.5451	+0.1442	+90 +22
31 Arietis	5.6	0.25	7.7	12 1.8	20 0 28.5	- 2 11.6	-0.9009	0.5468	0.1406	-18 -78
38 Arietis	5.2	0.23	8.0	12 2.4	4 29.1	+ 1 41.3	-0.3560	0.5485	0.1365	+14 -50
W. B. ii, 1033	5.9	0.15	8.4	12 48.9	14 39.7	+11 32.2	+0.1495	0.5527	0.1260	+43 -20
B. A. C. 987	6.3	-0.15	8.5	12 40.9	17 0.2	-10 11.9	+0.5842	0.5538	0.1233	+75 + 4
W. B. (2) iv, 59	6.4	+0.13	- 8.8	+17 1.7	21 20 57.8	- 7 10.6	-1.0775	0.5663	+0.0865	-33 -73
48 Tauri	6.4	0.13	9.5	15 9.5	22 26.6	- 5 44.9	+1.0243	0.5670	0.0843	+90 +38
$\gamma$ Tauri	3.9	0.15	9.5	15 23.6	22 0 14.1	- 4 1.1	+0.9238	0.5678	0.0816	+90 +31
55 Tauri	7.3	0.16	9.3	16 17.3	0 16.5	- 3 58.8	-0.0174	0.5678	0.0816	+33 -24
<i>α</i> Tauri	4.0	0.18	9.0	17 18.9	1 36.1	- 2 41.9	-0.9928	0.5685	0.0795	-26 -73
63 Tauri	5.6	+0.18	- 9.2	+16 33.0	1 49.7	- 2 28.8	-0.1688	0.5686	+0.0792	+24 -32
<i>δ</i> Tauri	4.7	0.18	9.0	17 13.2	2 7.1	- 2 12.1	-0.8507	0.5687	0.0787	-16 -72
70 Tauri	6.3	0.18	9.5	15 43.2	2 49.2	- 1 31.3	+0.7851	0.5690	0.0776	+90 +22
71 Tauri	6.0	0.18	9.7	15 23.9	3 8.8	- 1 12.5	+1.1490	0.5691	0.0771	+90 +50
75 Tauri	5.3	0.19	9.5	16 8.6	4 4.0	- 0 19.2	+0.4343	0.5695	0.0757	+62 + 1
<i>θ</i> Tauri	3.9	+0.19	- 9.6	+15 44.8	4 7.7	- 0 15.6	+0.8561	0.5695	+0.0756	+90 +27
80 Tauri	5.6	0.20	9.7	15 25.6	4 49.7	+ 0 24.9	+1.2461	0.5698	0.0745	+90 +63
B. A. C. 1391	5.0	0.20	9.6	15 59.0	5 0.2	+ 0 35.0	+0.6727	0.5699	0.0742	+90 +15
81 Tauri	5.5	0.20	9.7	15 28.8	5 3.0	+ 0 37.7	+1.2049	0.5700	0.0742	+90 +56
B. A. C. 1394	7.5	0.20	9.6	15 56.3	5 6.0	+ 0 40.6	+0.7266	0.5701	0.0741	+90 +19
85 Tauri	6.5	+0.21	- 9.7	+15 38.6	5 35.1	+ 1 8.7	+1.0729	0.5702	+0.0733	+90 +43
B. A. C. 1406	7.5	0.22	9.6	16 7.1	6 21.7	+ 1 53.6	+0.6201	0.5706	0.0721	+81 +13
<i>α</i> Tauri	1.0	0.23	9.6	16 18.8	7 21.9	+ 2 51.8	+0.4944	0.5710	0.0705	+76 + 5
89 Tauri	6.5	0.23	9.8	15 50.3	8 21.3	+ 3 49.1	+1.0629	0.5714	0.0689	+90 +42
<i>σ</i> Tauri	4.8	0.24	9.6	15 43.5	8 50.9	+ 4 17.7	+1.2154	0.5715	0.0681	+90 +58
B. A. C. 1526	5.8	+0.33	- 9.8	+17 0.0	16 44.2	+11 54.3	+0.3612	0.5749	+0.0550	+57 0
104 Tauri	5.1	0.39	9.5	18 30.8	21 2.8	- 7 56.4	-0.9999	0.5767	0.0476	-27 -71
111 Tauri	5.2	0.45	10.2	17 17.5	23 4 22.2	- 0 52.9	+0.5768	0.5796	0.0346	+76 +14
115 Tauri	5.4	0.47	10.1	17 52.6	5 32.6	+ 0 14.9	+0.0065	0.5800	0.0326	+34 -19
117 Tauri	6.3	0.47	10.4	17 9.4	5 55.2	+ 0 36.7	+0.7687	0.5801	0.0319	+90 +26
W. B. (2) v, 606	7.0	+0.48	-10.0	+18 17.1	6 27.2	+ 1 7.6	-0.3885	0.5803	+0.0309	+12 -42
119 Tauri	4.6	0.49	10.0	18 31.2	7 40.8	+ 2 18.5	-0.5962	0.5808	0.0286	0 -58
120 Tauri	5.3	0.50	10.0	18 28.2	8 14.5	+ 2 51.0	-0.5273	0.5810	0.0276	+ 4 -52
122 Tauri	5.4	0.51	10.6	16 58.7	9 46.0	+ 4 19.1	+1.0613	0.5816	0.0249	+90 +47
B. A. C. 1796	7.5	0.54	10.0	18 56.2	12 1.7	+ 6 29.9	-0.9201	0.5823	0.0207	-21 -71
127 Tauri	6.3	+0.55	-10.0	+18 55.8	12 12.3	+ 6 40.1	-0.9095	0.5824	+0.0204	-21 -71
130 Tauri	5.5	0.56	10.5	17 41.4	14 8.8	+ 8 32.4	+0.4122	0.5830	+0.0168	+61 + 6
71 Orionis	5.1	0.69	10.5	19 11.2	24 1 37.7	- 4 24.2	-1.0629	0.5866	-0.0050	-33 -71
20 Geminorum	6.3	0.77	11.2	17 50.7	8 54.2	+ 2 36.0	+0.2316	0.5884	0.0190	+48 - 4
21 Geminorum	6.5	0.77	11.2	17 51.0	8 54.5	+ 2 36.3	+0.2263	0.5884	0.0190	+48 - 5
23 Geminorum	7.1	+0.79	-11.6	+16 52.3	10 28.2	+ 4 6.4	+1.1965	0.5888	-0.0220	+90 +60



ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1904.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	$\lambda'$	$x'$	$y'$	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
26 Geminorum	5.1	+0.82	-11.4	+17 44.2	24 13 5.4	+ 6 35.8	+0.2455	0.5894	-0.0270	+49	- 4
W. B. (2)vi, 1630	6.2	0.91	11.6	17 53.3	21 20.5	- 9 25.9	-0.1995	0.5910	0.0430	+22	-31
51 Geminorum	5.4	0.95	12.3	16 19.1	25 1 51.9	- 5 4.8	+1.1844	0.5914	0.0517	+90	+56
2 Geminorum	3.6	0.98	12.2	16 42.6	3 47.9	- 3 13.2	+0.6816	0.5919	0.0554	+90	+18
B. A. C. 2432	7.0	1.00	11.7	18 27.3	5 48.9	- 1 16.7	-1.2060	0.5922	0.0593	+48	-72
W. B. (2)vii, 685	5.6	+1.04	-12.2	+17 17.2	9 24.2	+ 2 10.3	-0.2452	0.5926	-0.0661	+20	-35
67 Geminorum	7.5	1.04	12.7	15 50.5	10 5.2	+ 2 49.8	+1.1746	0.5927	0.0673	+90	+54
68 Geminorum	5.0	1.04	12.6	16 1.8	10 9.9	+ 2 54.4	+0.9786	0.5927	0.0675	+90	+36
f Geminorum	5.2	1.07	12.0	17 53.4	12 32.2	+ 5 11.2	-1.0712	0.5929	0.0720	-33	-72
1 Cancri	5.9	1.14	12.8	16 2.6	19 43.5	-11 53.9	+0.2317	0.5933	0.0852	+48	-11
B. A. C. 2649	6.3	+1.15	-12.5	+16 46.4	20 20.4	-11 18.4	-0.5581	0.5934	-0.0863	+ 2	-59
5 Cancri	6.4	1.16	12.6	16 43.0	21 33.5	-10 8.1	-0.6067	0.5934	0.0886	0	-59
29 Cancri	5.9	1.27	13.4	14 31.5	26 8 40.1	+ 0 33.1	+0.5041	0.5935	0.1081	+68	+ 2
B. A. C. 2872	6.8	1.29	13.7	13 34.9	10 38.6	+ 2 27.1	+1.2318	0.5934	0.1114	+90	+57
B. A. C. 3122	7.0	1.43	14.1	11 57.1	27 1 33.1	- 7 12.4	+1.0156	0.5926	0.1349	+90	+33
$\xi$ Leonis	5.2	+1.50	-14.0	+11 43.3	10 40.1	+ 1 33.9	-0.0455	0.5919	-0.1477	+31	-32
6 Leonis	3.8	1.53	14.3	10 19.5	14 28.6	+ 5 13.7	+0.7691	0.5914	0.1526	+90	+14
B. A. C. 3398	6.0	1.58	14.3	9 23.1	20 47.7	+11 18.5	+0.7130	0.5907	0.1602	+90	+ 9
11 Sextantis	6.0	1.60	14.5	8 46.1	21 29.8	+11 59.1	+1.2108	0.5906	0.1610	+90	+47
A Leonis	4.6	1.62	13.9	10 27.9	28 1 32.2	- 8 7.6	-1.1291	0.5901	0.1654	-36	-80
B. A. C. 3538	7.0	+1.67	-14.4	+ 9 26.7	7 29.5	- 2 23.8	-1.1216	0.5894	-0.1713	-35	-81
43 Leonis	6.5	1.67	14.0	7 1.6	7 49.7	- 2 4.3	+1.2131	0.5893	0.1716	+90	+46
44 Leonis	6.2	1.67	14.0	9 16.2	8 44.9	- 1 11.2	-1.1640	0.5892	0.1725	-39	-81
48 Leonis	5.2	1.70	14.1	7 26.6	12 44.2	+ 2 39.3	-0.0541	0.5887	0.1759	+31	-35
37 Sextantis	6.2	1.73	14.0	6 52.5	17 26.9	+ 7 11.4	-0.3297	0.5881	0.1796	+16	-52
56 Leonis	6.6	+1.75	-13.8	+ 6 41.6	21 36.2	+11 11.4	-0.9030	0.5876	-0.1825	-18	-83
d Leonis	5.0	1.78	14.1	4 7.7	23 30.7	-10 58.3	+1.2813	0.5874	0.1837	+90	+54
82 Leonis	6.9	1.83	13.4	3 49.6	29 10 3.1	- 0 49.2	-0.3843	0.5861	0.1887	+13	-57
83 Leonis	6.1	1.82	13.4	3 32.0	10 32.6	- 0 20.9	-0.1872	0.5860	0.1889	+23	-44
7 Leonis	5.1	1.83	13.4	3 22.9	11 0.5	+ 0 6.0	-0.1255	0.5859	0.1891	+27	-41
W. B. xi, 349	5.1	+1.83	-13.4	+ 3 21.3	11 0.9	+ 0 6.4	-0.1016	0.5859	-0.1891	+28	-39
80 Leonis	6.2	1.84	13.2	3 35.4	13 43.5	+ 2 43.0	-0.8467	0.5856	0.1899	-14	-86
3 Virginis	3.7	1.89	12.9	+ 2 18.1	20 34.6	+ 9 19.0	-0.8814	0.5849	0.1913	-16	-88
13 Virginis	6.3	1.92	11.9	- 0 15.4	30 8 27.3	- 3 14.5	-0.6267	0.5837	0.1913	-1	-78
7 Virginis	4.1	1.92	11.9	0 8.2	8 58.9	- 2 44.0	-0.8468	0.5836	0.1913	-14	-90
38 Virginis	6.2	+1.96	-10.5	- 3 2.1	23 7.9	+10 54.0	-0.6553	0.5825	-0.1871	- 3	-82
k Virginis	5.9	1.98	10.2	3 17.8	31 1 52.7	-10 27.1	-0.9069	0.5823	0.1858	-18	-90
51 Virginis	4.4	1.99	9.6	5 1.8	6 15.4	- 6 14.0	+0.0102	0.5820	0.1831	+33	-33
7 Virginis	6.1	1.99	8.6	5 58.6	14 59.3	+ 2 10.9	-0.6209	0.5814	0.1775	- 2	-78
k Virginis	4.9	1.99	8.5	5 45.7	15 39.1	+ 2 49.3	-0.9534	0.5813	0.1769	-22	-90
77 Virginis	7.0	+2.01	- 8.3	- 7 7.9	16 15.5	+ 3 24.4	+0.3105	0.5813	-0.1765	+51	-17
81 Virginis	7.0	2.01	8.1	7 23.1	18 2.4	+ 5 7.4	+0.2506	0.5812	0.1750	+47	-20
82 Virginis	5.3	+2.01	- 7.8	- 8 13.3	19 45.5	+ 6 46.8	+0.7903	0.5811	-0.1736	+82	+11

APRIL.

B. A. C. 4647	6.4	+1.99	- 7.2	- 7 35.3	1 1 28.7	-11 42.6	-0.8240	0.5807	-0.1684	-15	-90
94 Virginis	6.8	2.00	6.5	8 26.1	6 18.7	- 7 3.0	-0.7754	0.5804	0.1636	-12	-90
95 Virginis	5.7	2.01	6.3	8 51.4	6 29.5	- 6 52.6	-0.3798	0.5804	0.1634	+10	-58
96 Virginis	6.5	2.01	6.1	8 52.9	7 27.6	- 5 56.6	+0.4959	0.5803	0.1624	+63	- 7
k Virginis	4.3	+2.00	- 5.9	- 9 49.7	9 7.5	- 4 20.3	+0.1738	0.5802	-0.1606	+41	-24
2 Libræ	6.3	2.00	5.1	11 16.6	13 37.5	0 0.0	+0.9280	0.5799	0.1556	+79	+20
B. A. C. 4772	6.6	2.00	5.1	11 14.1	14 10.0	+ 0 31.3	+0.8021	0.5799	0.1550	+79	+11
B. A. C. 4828	6.0	1.97	4.2	11 53.9	19 28.8	+ 5 38.6	+0.6700	0.5795	0.1586	+75	+ 3
51 Libræ	5.9	1.94	3.3	11 30.5	2 54.8	-11 11.5	-0.7974	0.5788	0.1390	-16	-90
62 Libræ	6.3	+1.91	- 1.2	-14 47.5	15 12.5	+ 0 39.7	+0.9626	0.5775	-0.1216	+75	+24

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1904.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	$\gamma$	$x'$	$y'$	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m				°	°
$\gamma$ Libræ	4.0	+1.87	-0.5	-14 28.2	2 20 36.4	+ 5 52.0	-0.0022	0.5768	-0.1135	+26	-34
B. A. C. 5188	6.6	1.86	+0.1	14 44.1	3 0 1.2	+ 9 9.5	-0.1063	0.5763	0.1082	+20	-40
$\eta$ Libræ	5.5	1.85	0.1	15 22.0	0 17.8	+ 9 25.5	+0.5174	0.5763	0.1078	+58	- 5
$\theta$ Libræ	4.3	1.83	1.0	16 26.9	4 30.0	-10 31.3	+1.1997	0.5758	0.1011	+74	+46
49 Libræ	5.6	1.79	1.0	16 15.0	7 21.7	- 7 45.7	+0.7137	0.5753	0.0966	+73	+ 7
$\phi$ Ophiuchi	4.4	+1.68	+2.8	-16 24.2	20 45.9	+ 5 10.0	-0.2710	0.5727	-0.0743	+ 7	-51
24 Scorpïi	5.2	1.65	3.7	17 33.3	4 1 19.2	+ 9 33.7	+0.6185	0.5718	0.0666	+63	+ 1
B. A. C. 5695	6.2	1.56	4.1	16 39.2	7 41.6	- 8 17.3	-0.7227	0.5703	0.0557	-20	-90
B. A. C. 5771	6.2	1.52	4.8	17 28.9	13 5.2	- 3 5.0	-0.1239	0.5690	0.0464	+12	-41
B. A. C. 5839	6.0	1.46	5.3	17 39.3	18 15.5	+ 1 54.5	-0.1569	0.5676	0.0375	+10	-43
B. A. C. 6060	6.5	+1.27	+7.0	-18 47.0	5 10 24.4	- 6 29.9	+0.6687	0.5629	-0.0098	+64	+ 4
B. A. C. 6086	6.1	1.23	6.6	17 9.1	12 55.0	- 4 4.4	-1.1025	0.5622	-0.0056	-52	-90
B. A. C. 6201	7.3	1.14	7.6	18 39.3	20 47.5	+ 3 32.1	+0.5218	0.5595	+0.0076	+49	- 4
Y Sagittarii	Var.	1.13	7.7	18 54.1	22 0.5	+ 4 42.6	+0.7986	0.5591	0.0096	+71	+13
B. A. C. 6267	6.7	1.08	7.5	17 51.4	6 1 2.6	+ 7 38.6	-0.2917	0.5581	0.0146	0	-52
B. A. C. 6287	6.0	+1.07	+7.9	-18 47.2	2 3.7	+ 8 37.6	+0.7300	0.5577	+0.0162	+71	+ 8
B. A. C. 6294	5.2	1.07	7.8	17 28.0	2 38.6	+ 9 11.4	+0.3927	0.5573	0.0172	+41	-12
$\rho^1$ Sagittarii	3.9	0.76	8.4	18 1.6	7 2 10.7	+ 7 57.2	+0.7626	0.5492	0.0539	+72	+11
$\rho^2$ Sagittarii	6.1	0.76	8.6	18 29.1	2 14.7	+ 8 1.0	+1.2671	0.5492	0.0540	+72	+62
$\epsilon^1$ Sagittarii	5.6	0.65	8.0	16 30.7	11 18.9	- 7 12.2	-0.3418	0.5459	0.0671	+ 3	-56
$\epsilon^2$ Sagittarii	5.0	+0.64	+8.0	-16 20.8	12 11.0	- 6 21.8	-0.4635	0.5456	+0.0683	4	-65
B. A. C. 7466	5.5	0.63	7.7	15 41.4	12 41.3	- 5 52.5	-1.1501	0.5454	0.0691	-51	90
$\delta$ Sagittarii	5.0	0.55	7.7	15 44.7	19 40.2	+ 0 53.2	-0.5764	0.5430	0.0787	- 9	-75
B. A. C. 6992	6.2	0.43	7.5	15 5.2	8 6 52.1	+11 43.9	-0.3398	0.5392	0.0932	+ 6	-56
$\beta$ Capricorni	3.4	0.41	7.4	15 5.0	6 59.1	+11 50.7	-0.3326	0.5392	0.0933	+ 7	-55
B. A. C. 7009	7.0	+0.40	+7.2	-14 33.8	8 11.7	-10 59.0	-0.7925	0.5389	+0.0948	-20	-90
Lalande 39247	7.4	0.38	7.4	15 17.5	9 29.2	- 9 43.8	+0.1351	0.5384	0.0964	+33	-26
B. A. C. 7087	6.2	0.34	6.9	14 3.0	13 32.1	- 5 49.4	-0.8355	0.5371	0.1013	-22	-90
$\tau^1$ Capricorni	7.0	0.32	7.4	15 28.7	15 5.3	- 4 18.1	+0.9010	0.5366	0.1032	+75	+19
$\tau^2$ Capricorni	5.3	0.31	7.3	15 17.4	16 3.1	- 3 22.0	+0.7932	0.5364	0.1043	+75	+12
8 Aquarii	6.8	+0.20	+6.3	-13 26.0	9 2 27.0	+ 6 42.8	-0.1144	0.5334	+0.1159	+21	-41
9 Aquarii	7.0	0.19	6.5	13 54.2	3 3.6	+ 7 18.2	+0.4777	0.5332	0.1166	+57	- 7
18 Aquarii	5.4	+0.07	5.8	13 17.3	14 47.4	- 5 19.0	+1.2359	0.5303	0.1285	+77	+49
$\epsilon^1$ Capricorni	6.2	-0.01	4.2	9 43.1	10 2 11.2	+ 5 44.5	-1.1991	0.5284	0.1388	-47	-90
$\epsilon^2$ Capricorni	5.4	0.02	4.8	11 48.5	2 18.0	+ 5 51.0	+1.1340	0.5284	0.1389	+78	+37
B. A. C. 7620	6.5	-0.05	+4.3	-10 45.8	5 57.9	+ 9 24.4	+0.4898	0.5273	+0.1419	+62	- 7
36 Aquarii	6.3	0.10	3.3	8 39.4	14 12.9	- 6 35.1	-0.6476	0.5261	0.1483	- 4	-82
" Aquarii	4.3	0.13	2.9	8 15.6	18 3.9	- 2 50.9	-0.5105	0.5256	0.1510	+ 3	-68
B. A. C. 7774	6.2	0.14	3.3	9 31.1	18 5.2	- 2 49.6	+0.8861	0.5256	0.1510	+80	+17
$\rho$ Aquarii	5.4	0.15	2.9	8 18.2	19 49.6	- 1 8.2	-0.1964	0.5254	0.1522	+21	-46
B. A. C. 7804	6.2	-0.15	+2.6	- 7 40.7	21 34.6	+ 0 33.7	-0.6206	0.5253	+0.1534	- 2	-78
W. B. xxii, 493	6.2	0.18	2.1	7 2.6	11 1 38.0	+ 4 29.9	-0.6959	0.5249	0.1560	- 7	-88
67 Aquarii	6.2	0.23	1.8	7 27.9	7 53.5	+10 34.5	+0.7582	0.5245	0.1596	+75	+ 9
B. A. C. 7986	5.8	0.25	1.0	5 30.0	14 10.4	- 7 19.5	-0.4042	0.5243	0.1629	+11	59
B. A. C. 7993	6.6	0.26	0.9	5 19.4	15 16.9	- 6 15.0	-0.4182	0.5243	0.1634	+10	-60
B. A. C. 8017	6.1	-0.27	+0.7	- 5 13.7	17 30.5	- 4 5.3	-0.1582	0.5243	+0.1644	+24	-43
B. A. C. 8094	5.6	0.31	-0.1	4 1.2	12 0 53.5	+ 3 4.9	-0.2676	0.5244	0.1675	-19	-50
11 Piscium	6.5	0.33	0.9	2 19.2	8 11.0	+10 9.7	-0.9118	0.5248	0.1699	-19	-90
14 Piscium	5.9	0.34	1.2	1 46.7	10 38.7	-11 26.9	-1.0895	0.5250	0.1706	-31	-90
W. B. xxiii 1069	6.9	0.39	2.3	- 0 48.9	13 0 3.3	+ 1 34.3	+0.1583	0.5250	0.1726	+43	-25
B. A. C. 57	7.0	-0.41	-3.2	+ 1 9.2	9 25.3	+10 39.7	-0.3765	0.5282	+0.1736	+13	-57
NEW MOON.											
B. A. C. 1272	6.3	0.21	9.4	17 4.9	18 0 34.5	- 1 42.4	-1.2382	0.5696	0.0908	-52	-73
W. B. (2) iv, 59	6.4	0.20	9.5	17 1.7	2 35.0	+ 0 13.9	-1.0022	0.5703	0.0878	-27	73
48 Tauri	6.4	-0.20	-9.9	+15 9.5	4 3.1	+ 1 39.0	-1.0955	0.5709	+0.0855	-90	-44

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Parallels.	
Name.	Mag.	Red'ns from 1904.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	y'	x'	y'	N.	S.		
		$\Delta\alpha$	$\Delta\delta$										
		s	"	°	d	h	m	h	m		°	'	
$\gamma$ Tauri	3.9	-0.19	-10.0	+15 23.6	18	5	49.5	+ 3 21.7	+0.9966	0.5716	+0.0828	+90	+36
55 Tauri	7.3	0.18	9.8	16 17.3		5	51.8	+ 3 22.9	+0.0571	0.5716	0.0827	+37	-21
$\delta^1$ Tauri	4.0	0.17	9.6	17 18.9		7	10.8	+ 4 40.1	-0.9154	0.5719	0.0807	-20	-73
63 Tauri	5.6	0.17	9.8	16 33.0		7	24.3	+ 4 53.1	-0.0929	0.5722	0.0803	+29	-28
$\delta^2$ Tauri	4.7	0.17	9.7	17 13.1		7	41.6	+ 5 9.8	-0.7727	0.5723	0.0799	-11	-73
$\beta^1$ Tauri	4.2	-0.16	-9.6	+17 42.3		8	17.8	+ 5 44.8	-1.2371	0.5725	+0.0789	-53	-72
70 Tauri	6.3	0.17	10.0	15 43.2		8	23.3	+ 5 50.1	+0.8597	0.5726	0.0787	+90	+27
71 Tauri	6.0	0.17	10.1	15 23.9		8	42.7	+ 6 8.7	+1.2231	0.5727	0.0782	+90	+59
75 Tauri	5.3	0.16	10.0	16 8.6		9	37.5	+ 7 1.7	+0.5103	0.5730	0.0768	+69	+ 6
$\beta^2$ Tauri	3.9	0.16	10.1	15 44.8		9	41.1	+ 7 5.1	+0.9313	0.5731	0.0767	+90	+32
B. A. C. 1391	5.0	-0.16	-10.1	+15 59.0		10	33.1	+ 7 55.2	+0.7487	0.5734	+0.0753	+90	+20
81 Tauri	5.5	0.16	10.2	15 28.8		10	35.9	+ 7 58.0	+1.2800	0.5734	0.0752	+90	+70
B. A. C. 1394	7.5	0.16	10.1	15 56.3		10	38.9	+ 8 0.8	+0.8024	0.5734	0.0751	+90	+24
85 Tauri	6.5	0.15	10.2	15 38.6		11	7.8	+ 8 28.7	+1.1486	0.5736	0.0744	+90	+50
B. A. C. 1406	7.5	0.15	10.1	16 7.1		11	54.1	+ 9 13.5	+0.7061	0.5739	0.0731	+90	+17
$\alpha$ Tauri	1.0	-0.14	-10.1	+16 18.8		12	53.8	+10 11.0	+0.5724	0.5743	+0.0715	+75	+10
89 Tauri	6.5	0.13	10.2	18 50.3		13	52.8	+11 7.9	+1.1407	0.5746	0.0698	+90	+50
B. A. C. 1526	5.8	0.07	10.2	17 0.0		22	12.5	- 4 50.1	+0.4445	0.5775	0.0558	+64	+ 4
104 Tauri	5.1	-0.02	10.0	18 30.8	19	2	29.8	0 42.1	-0.9146	0.5789	0.0483	-20	-71
111 Tauri	5.2	+0.02	10.5	17 17.5		9	47.9	+ 6 20.2	+0.6663	0.5811	0.0353	+87	+19
115 Tauri	5.4	+0.03	-10.4	+17 52.6		10	58.1	+ 7 27.8	+0.0958	0.5814	+0.0331	+40	-13
117 Tauri	6.3	0.03	10.6	17 9.4		11	20.7	+ 7 49.6	+0.8593	0.5814	0.0324	+90	+31
W.B.(2),v,606	7.0	0.04	10.3	18 17.1		11	52.7	+ 8 20.5	-0.2994	0.5816	0.0314	+17	36
119 Tauri	4.6	0.05	10.3	18 31.2		13	6.3	+ 9 31.4	-0.5069	0.5819	0.0292	+ 5	-50
120 Tauri	5.3	0.05	10.3	18 28.2		13	39.9	+10 3.8	-0.4377	0.5821	0.0282	+ 9	-45
122 Tauri	5.4	+0.06	-10.8	+16 58.7		15	11.4	+11 31.9	+1.1545	0.5824	+0.0254	+90	+55
B. A. C. 1796	7.5	0.09	10.2	18 56.2		17	27.2	-10 17.2	-0.8301	0.5830	0.0212	-15	-71
127 Tauri	6.3	0.09	10.3	18 55.8		17	37.7	-10 7.1	-0.8195	0.5830	0.0208	-14	-71
130 Tauri	5.5	0.10	10.7	17 41.4		19	34.3	8 14.8	+0.5061	0.5834	+0.0171	+69	+11
71 Orionis	5.1	0.21	10.5	19 11.2	20	7	5.5	+ 2 50.9	-0.9705	0.5859	-0.0046	25	-71
20 Geminorum	6.3	+0.29	-11.0	+17 50.7		14	24.9	+ 9 54.0	+0.3319	0.5866	-0.0186	+55	+ 3
21 Geminorum	6.5	0.29	-11.0	17 51.0		14	25.2	+ 9 54.3	+0.3266	0.5866	0.0186	+55	+ 1
26 Geminorum	5.1	0.33	-11.1	17 44.2		18	38.4	-10 1.9	+0.3472	0.5869	0.0267	+56	+ 2
W.B.(2),vi,1630	6.2	0.42	-11.1	17 53.3	21	2	59.2	1 59.7	-0.0990	0.5875	0.0425	+28	-25
$\lambda$ Geminorum	3.6	0.49	-11.6	16 42.6		9	32.1	+ 4 18.5	+0.7904	0.5876	0.0549	+90	+25
B. A. C. 2432	7.0	+0.51	-11.0	+18 27.3		11	34.8	+ 6 16.6	-1.1136	0.5876	-0.0587	-37	-72
W.B.(2),vii,685	5.6	0.55	-11.4	17 17.3		15	14.0	+ 9 47.6	-0.1440	0.5875	0.0654	+26	-30
68 Geminorum	5.0	0.56	-11.9	16 1.8		16	0.4	+10 32.4	+1.0916	0.5875	0.0668	+90	+46
f Geminorum	5.2	0.59	-11.2	17 53.4		18	25.3	-11 8.1	-0.9778	0.5873	0.0712	-25	-72
1 Cancri	5.9	0.67	-11.8	16 2.6	22	1	45.2	- 4 4.8	+0.3382	0.5869	0.0843	-55	- 5
B. A. C. 2649	6.3	+0.67	-11.6	+16 46.5		2	23.0	- 3 28.4	-0.4603	0.5869	-0.0854	+ 8	-52
5 Cancri	6.4	0.69	-11.6	16 43.0		3	37.6	- 2 16.5	-0.5094	0.5868	0.0876	+ 5	-55
29 Cancri	5.9	0.82	-12.3	14 31.5		15	0.2	+ 8 40.7	+0.6135	0.5856	0.1068	-79	+ 9
B. A. C. 3122	7.0	1.02	-12.9	11 57.1	23	8	21.5	+ 1 23.5	+1.1304	0.5838	0.1332	+90	+42
$\xi$ Leonis	5.2	1.12	-12.7	11 43.3		17	45.5	+10 26.8	+0.0496	0.5819	0.1456	38	-26
$\eta$ Leonis	3.8	+1.17	-13.0	+10 19.5		21	41.4	- 9 45.8	+0.8741	0.5813	-0.1505	+90	+20
B. A. C. 3398	6.0	1.24	-13.1	9 23.1	24	4	12.8	- 3 28.7	+0.8146	0.5804	0.1579	+90	+15
$\Lambda$ Leonis	4.6	1.29	-12.5	10 27.9		9	6.8	+ 1 14.7	-1.0584	0.5797	0.1631	29	-80
B. A. C. 3538	7.0	1.36	-12.6	9 26.7		15	16.2	+ 7 10.7	-1.0551	0.5788	0.1691	-29	-81
43 Leonis	6.5	1.35	-13.4	7 1.6		15	36.9	+ 7 30.7	+1.3161	0.5788	0.1692	+90	+65
44 Leonis	6.2	+1.38	-12.6	+ 9 16.2		16	33.9	+ 8 25.6	-1.0982	0.5787	-0.1702	-33	-81
48 Leonis	5.2	1.42	-12.9	7 26.7		20	41.5	-11 35.7	+0.0253	0.5782	0.1735	+35	31
37 Sextantis	6.2	1.48	-12.8	6 52.5	25	1	33.6	6 54.1	-0.2580	0.5776	0.1772	+20	48
56 Leonis	6.6	1.52	-12.6	6 41.7		5	51.2	2 45.8	-0.8433	0.5773	0.1801	-14	83
82 Leonis	6.9	1.66	-12.5	3 49.6		18	42.2	+ 9 37.6	-0.3279	0.5763	0.1865	+16	53
83 Leonis	6.1	+1.65	-12.5	+ 3 32.0		19	12.7	+10 7.1	-0.1286	0.5763	0.1867	+27	-41

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1904.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$	$^{\circ}$ $'$ "	d h m	h m				$^{\circ}$ $'$ "	$^{\circ}$ $'$ "
$\tau$ Leonis	5.1	+1.68	-12.5	+ 3 22.9	25 19 41.7	+10 35.1	-0.0673	0.5762	-0.1869	+30	-38
W. B. xi, 349	5.1	1.68	12.6	3 21.4	19 41.8	+10 35.2	-0.0420	0.5762	0.1869	+32	-36
89 Leonis	6.2	1.70	12.3	3 35.4	22 29.5	-10 43.2	-0.8005	0.5761	0.1878	-11	-85
$\beta$ Virginis	3.7	1.78	12.1	+ 2 18.1	26 5 32.8	- 3 54.9	-0.8421	0.5759	0.1895	-13	-88
13 Virginis	6.3	1.89	11.5	- 0 15.4	17 45.0	+ 7 51.2	-0.5964	0.5758	0.1899	+ 1	-76
$\eta$ Virginis	4.1	+1.89	-11.4	- 0 8.2	18 17.5	+ 8 22.6	-0.8200	0.5759	-0.1899	-12	-90
38 Virginis	6.2	2.01	10.3	3 2.1	27 8 46.0	- 1 39.9	-0.6420	0.5764	0.1863	- 2	-80
$\delta$ Virginis	5.9	2.05	10.3	3 17.8	11 34.1	+ 1 2.3	-0.8991	0.5764	0.1852	-17	-90
51 Virginis	4.4	2.09	9.8	5 1.8	16 1.7	+ 5 20.4	+0.0207	0.5768	0.1830	+34	-33
$\delta$ Virginis	6.1	2.14	8.8	5 58.6	28 0 53.9	-10 6.5	-0.6261	0.5774	0.1775	- 2	-79
$\rho^2$ Virginis	4.9	+2.14	- 8.7	- 5 45.8	1 34.3	- 9 27.4	-0.9618	0.5774	-0.1770	-22	-90
77 Virginis	7.0	2.16	8.8	7 7.9	2 11.2	- 8 51.8	+0.3101	0.5775	0.1766	-51	-17
81 Virginis	7.0	2.17	8.6	7 23.1	3 59.5	- 7 7.4	+0.2474	0.5776	0.1753	+47	-20
82 Virginis	5.3	2.19	8.4	8 13.3	5 43.9	- 5 26.8	+0.7877	0.5777	0.1739	+82	+10
B. A. C. 4647	6.4	2.20	7.6	7 35.3	11 30.9	+ 0 7.9	-0.8432	0.5781	0.1690	-16	-90
94 Virginis	6.8	+2.23	- 7.0	- 8 26.1	16 23.3	+ 4 49.8	-0.7999	0.5786	-0.1644	-14	-90
95 Virginis	5.7	2.25	7.0	8 51.4	16 34.3	+ 5 0.4	-0.4030	0.5786	0.1642	+ 9	-59
96 Virginis	6.5	2.26	6.9	9 52.9	17 32.8	+ 5 56.8	+0.4752	0.5786	0.1633	+61	- 8
$\kappa$ Virginis	4.3	2.26	6.6	9 49.7	19 13.3	+ 7 33.7	+0.1496	0.5787	0.1615	+40	-26
2 Libræ	6.3	2.30	6.0	11 16.6	23 44.8	+11 55.4	+0.8999	0.5790	0.1567	+79	+18
B. A. C. 4772	6.6	+2.29	- 5.8	-11 14.2	29 0 17.4	-11 33.3	+0.7730	0.5791	-0.1561	+79	+ 9
B. A. C. 4828	6.0	2.30	5.0	11 53.9	5 37.2	- 6 24.9	+0.6329	0.5794	0.1499	+73	+ 1
$\zeta^1$ Libræ	5.9	2.31	4.1	11 30.5	13 3.4	+ 0 45.3	-0.8461	0.5797	0.1405	-19	-90
$\alpha^2$ Libræ	6.3	2.36	2.1	14 47.5	30 1 18.5	-11 26.2	+0.8981	0.5800	0.1235	+75	+18
$\gamma$ Libræ	4.0	2.35	1.3	14 28.2	6 40.2	- 6 16.1	-0.0723	0.5800	0.1153	+22	-38
B. A. C. 5188	6.6	+2.36	- 0.7	-14 44.1	10 3.3	- 3 0.3	-0.1802	0.5799	-0.1100	+16	-45
$\eta$ Libræ	5.5	2.35	- 0.6	15 22.1	10 19.8	- 2 44.4	+0.4414	0.5798	0.1096	+53	-10
$\theta$ Libræ	4.3	2.35	+ 0.2	16 26.9	14 29.6	+ 1 16.4	+1.1161	0.5797	0.1030	+74	+36
49 Libræ	5.6	+2.32	+ 0.4	-16 15.0	17 19.3	+ 4 0.0	+0.6286	0.5795	-0.0984	-66	+ 1

MAY.

$\phi$ Ophiuchi	4.4	+2.28	+ 2.5	-16 24.2	1 6 33.0	- 7 14.8	-0.3677	0.5782	-0.0761	+ 4	-58
24 Scorpii	5.2	2.28	3.3	16 33.4	11 2.1	- 2 55.4	+0.5123	0.5775	0.0683	+55	- 6
B. A. C. 5695	6.2	2.22	4.0	16 39.2	17 18.2	+ 3 7.4	-0.8277	0.5765	0.0573	-27	-90
B. A. C. 5771	6.2	+2.20	+ 4.8	-17 28.9	22 36.1	+ 8 13.9	-0.2379	0.5753	-0.0479	+ 7	-49
B. A. C. 5839	6.0	2.16	5.5	17 39.3	2 3 40.6	-10 52.4	-0.2754	0.5739	0.0388	+ 4	-51
B. A. C. 6060	6.5	2.03	7.6	18 47.0	19 30.7	+ 4 24.3	+0.5294	0.5696	0.0107	+51	- 4
B. A. C. 6086	6.1	1.98	7.5	17 9.1	21 58.3	+ 6 46.8	-1.2304	0.5688	-0.0064	-66	-90
B. A. C. 6201	7.3	1.93	8.6	18 39.2	3 5 41.3	- 9 46.2	+0.3753	0.5661	+0.0070	+38	-13
Y Sagittarii	Var.	+1.92	+ 8.8	-18 54.0	6 52.8	- 8 37.2	+0.6490	0.5656	+0.0091	+61	+ 3
B. A. C. 6267	6.7	1.87	8.8	17 51.4	9 51.2	- 5 44.9	-0.4353	0.5645	0.0141	- 8	-63
B. A. C. 6287	6.0	1.87	9.1	18 47.2	10 51.2	- 4 46.9	+0.5779	0.5642	0.0158	+55	0
B. A. C. 6294	5.2	1.86	9.1	18 28.0	11 25.3	- 4 13.9	+0.2429	0.5639	0.0168	+31	-20
$\rho^1$ Sagittarii	3.9	1.59	10.5	18 1.5	4 10 30.5	- 5 55.3	+0.5956	0.5545	0.0540	+60	0
$\rho^2$ Sagittarii	6.1	+1.59	+10.6	-18 29.0	10 34.5	- 5 51.5	+1.0966	0.5544	+0.0541	+72	+36
$\epsilon^1$ Sagittarii	5.6	1.47	10.4	16 30.7	19 29.5	+ 2 46.1	-0.5049	0.5506	0.0674	- 6	-68
$\epsilon^2$ Sagittarii	5.0	1.46	10.4	16 20.8	20 20.7	+ 3 35.6	-0.6263	0.5503	0.0687	-13	-81
$\zeta$ Sagittarii	5.0	1.38	10.4	15 44.6	5 3 43.0	+10 43.7	-0.7415	0.5480	0.0790	-19	-90
B. A. C. 6992	6.2	1.25	10.4	15 5.1	14 45.8	- 2 34.5	-0.5099	0.5426	0.0937	- 3	-69
$\beta$ Capricorni	3.4	+1.23	+10.4	-15 4.9	14 52.7	- 2 27.8	-0.5025	0.5424	+0.0938	- 3	-68
B. A. C. 7009	7.0	1.21	10.3	14 33.7	16 4.3	- 1 18.5	-0.9606	0.5420	0.0953	-31	-90
Lal. 39247	7.4	1.20	10.5	15 17.4	17 21.0	- 0 4.2	-0.0383	0.5414	0.0969	+23	-36
B. A. C. 7087	6.2	1.15	10.1	14 3.0	21 21.1	+ 3 48.3	-1.0045	0.5398	0.1018	-34	-90
$\pi^1$ Capricorni	7.0	1.13	10.6	15 28.6	22 53.3	+ 5 17.7	+0.7227	0.5392	0.1036	+74	+ 7
$\pi^2$ Capricorni	5.3	+1.12	+10.6	-15 17.3	23 50.5	+ 6 13.1	+0.6154	0.5389	+0.1048	+67	+ 1

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1904.0.		Apparent Declination.	Washington Mean Time.	Hour Angle. H	λ	α	γ	N.	S.
		Δα	Δδ								
		s	"	°	d h m	h m				°	°
W.B.xx, 1293	6.0	+1.00	+10.4	-14 51.1	6 9 31.0	- 8 24.3	+1.2030	0.5352	+0.1157	+75	+45
8 Aquarii	6.8	0.99	9.9	13 25.9	10 8.6	- 7 47.9	-0.2884	0.5350	0.1164	+12	-52
9 Aquarii	7.0	0.99	10.0	13 54.2	10 44.9	- 7 12.7	+0.3012	0.5348	0.1191	+45	-17
18 Aquarii	5.4	0.85	9.6	13 17.3	22 24.0	+ 4 5.2	+1.0578	0.5310	0.1289	+77	+30
λ Capricorni	5.4	0.73	8.8	11 48.4	7 9 51.8	- 8 47.6	+0.9597	0.5277	0.1392	-78	+24
B. A. C. 7620	6.5	+0.69	+ 8.3	-10 45.7	13 31.3	- 5 14.6	+0.3190	0.5269	+0.1422	+49	-17
36 Aquarii	6.3	0.61	7.2	8 39.4	21 45.5	+ 2 45.1	-0.8129	0.5251	0.1485	-15	-90
θ Aquarii	4.3	0.58	6.9	8 15.6	8 1 36.4	+ 6 29.3	-0.6744	0.5245	0.1512	- 6	-85
B. A. C. 7774	6.2	0.57	7.3	9 31.0	1 37.7	+ 6 30.6	+0.7197	0.5245	0.1513	+80	+ 6
ρ Aquarii	5.4	0.56	6.8	8 18.1	3 22.1	+ 8 11.9	-0.3605	0.5242	0.1524	+12	-56
B. A. C. 7804	6.2	+0.54	+ 6.6	- 7 40.6	5 7.2	+ 9 53.9	-0.7829	0.5239	+0.1536	-12	-90
W. B. xxii, 493	6.2	0.51	6.1	7 2.6	9 10.8	-10 9.6	-0.8558	0.5233	0.1562	-17	-90
67 Aquarii	6.2	0.44	5.9	7 27.8	15 26.9	- 4 4.3	+0.6004	0.5227	0.1598	+73	- 1
B. A. C. 7986	5.8	0.39	4.9	5 29.9	21 44.6	+ 2 2.4	-0.5564	0.5223	0.1631	+ 2	-72
B. A. C. 7993	6.6	0.39	4.8	5 19.3	22 51.3	+ 3 7.2	-0.5691	0.5222	0.1636	+ 2	-73
B. A. C. 8017	6.1	+0.36	+ 4.6	- 5 13.6	9 1 5.2	+ 5 17.1	-0.3074	0.5221	+0.1646	+16	-53
B. A. C. 8094	5.6	0.31	3.8	4 1.1	8 29.7	-11 31.2	-0.4099	0.5221	0.1677	+11	-60
11 Piscium	6.5	0.26	2.8	2 19.1	15 48.7	- 4 24.9	-1.0466	0.5224	0.1701	-28	-90
14 Piscium	5.9	0.24	2.5	1 46.6	18 16.8	- 2 1.1	-1.2221	0.5226	0.1708	-45	-90
W. B. xxiii, 1069	6.9	0.14	1.2	- 0 48.8	10 7 44.3	+11 3.0	+0.0403	0.5243	0.1735	+36	-22
B. A. C. 57	7.0	+0.09	+ 0.1	+ 1 9.3	17 8.0	3 49.8	-0.4827	0.5260	+0.1742	+ 8	-65
44 Piscium	5.8	0.06	- 0.3	1 24.5	21 5.3	+ 0 0.6	-0.0702	0.5271	0.1742	+30	-38
B. A. C. 167	7.5	+0.04	1.0	2 35.9	11 4 10.7	+ 6 53.4	-0.1355	0.5289	0.1737	+27	-42
B. A. C. 237	6.7	-0.02	1.6	2 51.8	10 25.2	-11 3.3	+0.6551	0.5308	0.1727	+83	+ 2
B. A. C. 243	7.3	0.02	1.9	3 33.9	11 27.2	-10 3.1	+0.0702	0.5312	0.1725	+39	-30
73 Piscium	6.4	-0.04	- 2.7	+ 5 8.5	17 19.0	- 4 21.8	-0.6336	0.5332	+0.1711	- 1	-58
77 Piscium	6.1	0.05	2.6	4 23.8	17 47.9	- 3 53.8	+0.2567	0.5333	0.1709	+49	-20
ε Piscium	5.7	0.05	2.9	5 8.5	19 6.1	- 2 37.9	-0.3286	0.5339	0.1705	+16	-53
JUPITER				5 41.4	19 50.6	- 1 54.8	-0.7980	0.5245	0.1667	+10	-84
88 Piscium	6.2	0.05	3.3	6 29.2	22 16.6	+ 0 26.8	-1.2461	0.5350	0.1695	-48	-84
B. A. C. 410	7.4	-0.07	- 3.7	+ 6 54.5	12 2 24.2	+ 4 26.8	-1.0046	0.5366	+0.1680	-25	-83
96 Piscium	6.6	0.09	3.9	6 47.8	5 27.7	+ 7 24.7	-0.3716	0.5379	0.1667	+14	-55
μ Piscium	5.2	0.10	3.8	5 38.9	6 1.0	+ 7 56.9	+0.9620	0.5381	0.1664	+90	+23
ν Piscium	4.4	0.12	4.8	8 40.4	13 32.0	- 8 45.9	-1.0624	0.5414	0.1627	-29	-81
NEW MOON.											
111 Tauri	5.2	-0.15	-10.3	+17 17.5	16 16 17.2	- 9 33.0	+0.7829	0.5876	+0.0371	+90	+26
115 Tauri	5.4	0.15	10.3	17 52.6	17 16.1	- 8 26.7	+0.2185	0.5879	0.0350	+47	- 7
117 Tauri	6.3	0.15	10.5	17 9.4	17 38.3	- 8 5.3	+0.9765	0.5880	0.0343	+90	+30
W.B.(2)v, 606	7.0	0.15	10.3	18 17.1	18 9.7	- 7 35.1	-0.1723	0.5882	0.0333	+24	-28
119 Tauri	4.6	-0.14	-10.3	+18 31.2	19 21.7	- 6 25.8	-0.3766	0.5885	+0.0310	+13	-41
120 Tauri	5.3	0.14	10.3	18 28.2	19 54.7	- 5 54.0	-0.3072	0.5886	0.0300	+17	-36
B. A. C. 1796	7.5	0.13	10.3	18 56.2	23 37.6	- 2 19.4	-0.6916	0.5895	0.0228	- 6	-67
127 Tauri	6.3	0.12	10.3	18 55.8	23 48.0	- 2 9.4	-0.6808	0.5895	0.0225	- 5	-66
130 Tauri	5.5	0.12	10.6	17 41.4	17 1 42.4	- 0 19.2	+0.6375	0.5903	+0.0188	+83	+19
71 Orionis	5.1	-0.06	-10.5	+19 11.2	13 0.7	+10 33.6	-0.8144	0.5918	-0.0035	-14	-71
20 Geminorum	6.3	0.02	10.7	17 50.7	20 12.5	- 6 31.0	+0.4882	0.5921	0.0176	+67	+11
21 Geminorum	6.5	-0.02	10.7	17 51.0	20 12.9	- 6 30.6	+0.4830	0.5923	0.0176	+67	+10
22 Geminorum	7.2	0.00	10.4	19 30.0	21 9.1	- 5 36.5	-1.2272	0.5923	0.0194	-53	-71
26 Geminorum	5.1	+0.02	10.8	17 44.2	18 0 21.9	- 2 31.0	+0.5084	0.5925	0.0258	+69	+11
W.B.(2)vi, 1630	6.2	+0.08	-10.7	+17 53.3	8 35.1	+ 5 23.5	+0.0734	0.5923	-0.0419	+39	-15
λ Geminorum	3.6	0.13	11.0	16 42.6	15 2.8	+11 36.5	+0.9652	0.5919	0.0543	+90	+37
B. A. C. 2432	7.0	0.15	10.5	18 27.3	17 4.2	-10 26.7	-0.9288	0.5918	0.0582	-21	-72
W.B.(2)vii, 685	5.6	0.18	10.8	17 17.3	20 40.7	- 6 58.4	+0.0401	0.5913	0.0650	+37	-20
f Geminorum	5.2	0.21	10.6	17 53.4	23 50.0	- 3 56.2	-0.7885	0.5909	0.0708	-12	-72
1 Cancri	5.9	+0.28	-11.0	+16 2.6	19 7 6.2	+ 3 3.6	+0.5295	0.5896	-0.0840	+71	+ 6

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

THE STAR'S				AT CONJUNCTION IN R. A.							Limiting Parallels.	
Name.	Mag.	Red'ns from 1904.0.		Apparent Declination.	Washington Mean Time.	Hour Angle. H	Y	x'	y'	N.	S.	
		$\Delta\alpha$	$\Delta\delta$		d h m	h m						
B. A. C. 2649	6.3	+0.29	-10.7	+16 46.5	19 7 43.6	+ 3 39.5	-0.2669	0.5895	-0.0851	+19	-39	
3 Cancr	6.0	0.29	10.4	17 34.1	8 39.2	+ 4 33.0	-1.1551	0.5893	0.0868	-41	-72	
5 Cancr	6.4	0.30	10.7	16 43.0	8 57.8	+ 4 51.0	-0.3153	0.5892	0.0873	+16	-42	
29 Cancr	5.9	0.42	11.1	14 31.5	20 17.0	- 8 15.2	+0.8139	0.5867	0.1065	+90	+21	
ξ Leonis	5.2	0.73	11.2	11 43.3	20 23 6.3	- 6 25.0	+0.2583	0.5794	0.1451	+50	-15	
o Leonis	3.8	+0.78	-11.4	+10 19.6	21 3 4.2	- 2 35.7	+1.0874	0.5783	0.1498	+50	+36	
B. A. C. 3398	6.0	0.86	11.5	9 23.1	9 39.9	+ 3 45.7	+1.0273	0.5766	0.1572	+90	+30	
A Leonis	4.6	0.92	10.8	10 27.9	14 37.6	+ 8 32.8	-0.8586	0.5752	0.1622	-15	-80	
B. A. C. 3538	7.0	1.00	10.8	9 26.7	20 52.5	- 9 25.6	-0.8582	0.5737	0.1679	-15	-81	
44 Leonis	6.2	1.02	10.7	9 16.2	22 11.5	- 8 9.4	-0.9025	0.5734	0.1690	-18	-81	
48 Leonis	5.2	+1.08	-11.2	+ 7 26.7	22 2 23.3	- 4 6.5	+0.2279	0.5724	-0.1724	+47	-20	
37 Sextantis	6.2	1.15	11.1	6 52.6	7 20.8	+ 0 40.5	-0.0605	0.5714	0.1760	+31	-36	
56 Leonis	6.6	1.20	10.8	6 41.7	11 43.7	+ 4 54.1	-0.6546	0.5705	0.1788	- 2	-79	
82 Leonis	6.9	1.38	10.9	3 49.6	23 0 52.1	- 6 25.0	-0.1458	0.5686	0.1851	+26	-42	
83 Leonis	6.1	1.36	10.9	3 32.0	1 23.3	- 5 54.9	+0.0551	0.5685	0.1853	+37	-31	
7 Leonis	5.1	+1.39	-10.9	+ 3 22.9	1 52.8	- 5 26.4	+0.1173	0.5684	-0.1854	+41	-27	
W. B. xi, 349	5.1	1.39	10.9	3 21.4	1 53.1	- 5 26.1	+0.1422	0.5684	0.1854	+42	-26	
89 Leonis	6.2	1.42	10.6	3 35.4	4 45.0	- 2 40.2	-0.6276	0.5681	0.1863	0	-78	
β Virginis	3.7	1.54	10.5	+ 2 18.2	11 59.2	+ 4 19.0	-0.6783	0.5675	0.1879	- 3	-84	
13 Virginis	6.3	1.69	10.0	- 0 15.4	24 0 31.3	- 7 34.9	-0.4467	0.5670	0.1884	+10	-63	
η Virginis	4.1	+1.69	- 9.9	- 0 8.2	1 4.7	- 7 2.6	-0.6738	0.5671	-0.1884	- 3	-84	
38 Virginis	6.2	1.88	9.2	3 2.1	15 57.6	+ 7 19.4	-0.5167	0.5674	0.1852	+ 5	-68	
κ Virginis	5.9	1.93	9.2	3 17.8	18 50.4	+10 6.3	-0.7816	0.5676	0.1841	-10	-90	
46 Virginis	6.1	1.92	8.7	2 51.3	19 15.6	+10 30.6	-1.3085	0.5677	0.1839	-58	-90	
48 Virginis	6.6	1.94	8.6	3 8.9	20 44.2	+11 56.1	-1.2806	0.5679	0.1832	53	-90	
51 Virginis	4.4	+1.99	- 8.8	- 5 1.8	23 25.5	- 9 28.2	+0.1413	0.5680	-0.1820	+42	-26	
1 <sup>a</sup> Virginis	6.1	2.09	7.9	5 58.6	25 8 32.3	- 0 40.4	-0.5297	0.5689	0.1768	+ 4	-69	
1 <sup>a</sup> Virginis	4.9	2.09	7.8	5 45.7	9 13.8	- 0 0.3	-0.8706	0.5690	0.1763	-17	-90	
77 Virginis	7.0	2.12	8.0	7 7.9	9 51.7	+ 0 36.3	+0.4148	0.5690	0.1759	+58	-11	
81 Virginis	7.0	2.14	7.8	7 23.1	11 42.8	+ 2 23.5	+0.3480	0.5693	0.1746	+54	-15	
82 Virginis	5.3	+2.16	- 7.7	- 8 13.3	13 30.0	+ 4 7.0	+0.8910	0.5695	-0.1733	+82	+17	
B. A. C. 4647	6.4	2.20	6.8	7 35.3	19 26.1	+ 9 50.7	-0.7703	0.5703	0.1687	-11	-90	
94 Virginis	6.8	2.26	6.3	7 26.1	26 0 25.6	- 9 20.2	-0.7357	0.5710	0.1643	-10	-90	
95 Virginis	5.7	2.28	6.6	8 51.4	0 36.8	- 9 9.5	-0.3348	0.5710	0.1641	+13	-55	
96 Virginis	6.5	2.30	6.4	9 52.9	1 36.7	- 8 11.6	+0.5507	0.5711	0.1632	+67	- 4	
κ Virginis	4.3	+2.31	- 6.2	- 9 49.7	3 19.7	- 6 32.3	+0.2179	0.5714	-0.1615	+44	-22	
2 Libræ	6.3	2.37	5.7	11 16.6	7 57.4	- 2 4.3	+0.9664	0.5722	0.1569	+79	+22	
B. A. C. 4772	6.6	2.38	5.6	11 14.2	8 30.8	- 1 32.1	+0.8397	0.5722	0.1563	+79	+13	
B. A. C. 4828	6.0	2.40	4.8	11 53.9	13 57.5	+ 3 43.2	+0.6837	0.5730	0.1503	+77	+ 4	
ξ <sup>1</sup> Libræ	5.9	2.46	3.7	11 30.5	21 32.5	+11 2.2	-0.8245	0.5741	0.1412	-18	-90	
o <sup>2</sup> Libræ	6.3	+2.59	- 2.1	-14 47.5	27 10 0.1	- 0 56.7	+0.9070	0.5757	-0.1246	+75	+19	
γ Libræ	4.0	2.61	1.1	14 28.2	15 26.3	+ 4 18.0	-0.0819	0.5762	0.1167	+22	-39	
B. A. C. 5188	6.6	2.64	0.6	14 44.1	18 51.9	+ 7 36.2	-0.1977	0.5765	0.1115	+15	-46	
η Libræ	5.5	2.64	- 0.6	15 22.1	19 8.6	+ 7 52.4	+0.4272	0.5766	0.1111	+52	-10	
θ Libræ	4.3	2.67	+ 0.1	16 26.9	23 21.2	+11 56.0	+1.0964	0.5768	0.1046	+74	+34	
49 Libræ	5.6	+2.67	+ 0.4	-16 15.0	28 2 12.6	- 9 18.8	+0.5998	0.5769	-0.1001	+64	0	
φ Ophiuchi	4.4	2.69	2.8	16 24.2	15 32.0	+ 3 32.1	-0.4286	0.5772	0.0780	- 1	-62	
24 Scorp	5.2	2.70	3.5	17 33.3	20 2.3	+ 7 52.7	+0.4448	0.5770	0.0703	+49	- 9	
B. A. C. 5695	6.2	2.69	4.5	16 39.2	29 2 19.3	-10 3.6	-0.9113	0.5768	0.0593	-32	-90	
B. A. C. 5771	6.2	2.69	5.3	17 28.8	7 37.4	- 4 56.8	-0.3305	0.5761	0.0499	+ 2	-55	
B. A. C. 5839	6.0	+2.68	+ 6.1	-17 39.3	12 42.0	- 0 3.0	-0.3782	0.5753	-0.0408	- 2	-59	
B. A. C. 6060	6.5	2.64	8.6	18 47.0	30 4 28.1	- 8 50.4	+0.3972	0.5723	-0.0125	+41	-12	
B. A. C. 6201	7.3	2.58	10.0	18 39.2	14 34.3	+ 0 54.7	+0.2245	0.5693	+0.0054	+29	-22	
Y Sagittarii	Var.	2.57	10.1	18 54.0	15 45.2	+ 2 3.1	+0.4958	0.5691	0.0074	+47	- 6	
B. A. C. 6267	6.7	2.54	10.2	17 51.4	18 42.0	+ 4 53.8	-0.5919	0.5682	0.0126	-17	-78	
B. A. C. 6287	6.0	+2.55	+10.5	-18 47.2	19 41.5	+ 5 51.3	+0.4179	0.5678	+0.0143	+42	-10	

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1904.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, <i>H</i>	<i>Y</i>	<i>x</i> '	<i>y</i> '	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	"	° ' "	d h m	h m				° °	
B. A. C. 6294	5.2	+2.54	+10.5	-18 27.9	30 20 15.3	+ 6 23.9	+0.0825	0.5677	+0.0153	+21	-29
$\rho^1$ Sagittarii	3.9	2.34	12.8	18 1.5	31 19 5.8	+ 4 28.0	+0.3974	0.5587	0.0531	+44	-12
$\rho^2$ Sagittarii	6.1	2.35	12.9	18 29.0	19 9.7	+ 4 31.7	+0.8966	0.5587	0.0532	+72	+19
B. A. C. 6658	7.0	+2.32	+13.1	-18 33.0	22 3.2	+ 7 19.5	+1.1311	0.5576	+0.0578	+71	+39

JUNE.

B. A. C. 6710	6.0	+2.28	+13.5	-18 26.5	1 2 13.7	+11 21.6	+1.2692	0.5558	+0.0641	+72	+62
$\epsilon^1$ Sagittarii	5.6	2.24	13.1	16 30.6	3 58.2	-10 57.4	-0.7125	0.5550	0.0667	-18	-90
$\epsilon^2$ Sagittarii	5.0	2.23	13.1	16 20.7	4 48.9	-10 8.4	-0.8344	0.5547	0.0678	-26	-90
$\delta$ Sagittarii	5.0	+2.16	+13.4	-15 44.6	12 5.8	- 3 5.7	-0.9588	0.5514	+0.0785	-33	-90
B. A. C. 6992	6.2	2.05	13.7	15 5.1	23 0.8	+ 7 28.2	-0.7410	0.5465	0.0934	-17	-90
$\beta$ Capricorni	3.4	2.04	13.8	15 4.9	23 7.5	+ 7 34.6	-0.7340	0.5464	0.0935	-16	-90
B. A. C. 7009	7.0	2.02	13.7	14 33.7	2 0 18.4	+ 8 43.3	-1.1917	0.5459	0.0951	-52	-90
Lalande 39247	7.4	2.01	13.9	15 17.4	1 34.1	+ 9 56.6	-0.2739	0.5453	0.0967	+10	-51
B. A. C. 7087	6.2	+1.97	+13.7	-14 2.9	5 31.7	-10 13.4	-1.2414	0.5436	+0.1017	-58	-90
$\tau^1$ Capricorni	7.0	1.96	14.2	15 28.6	7 2.9	- 8 45.0	+0.4792	0.5429	0.1035	+56	- 7
$\tau^2$ Capricorni	5.3	1.95	14.2	15 17.3	7 59.4	- 7 50.3	+0.3712	0.5425	0.1047	+48	-13
W. B. xx, 1293	6.0	1.83	14.3	14 51.0	17 33.9	+ 1 26.3	+0.9486	0.5383	0.1157	+75	+22
8 Aquarii	6.8	1.82	13.8	13 25.9	18 11.2	+ 2 2.4	-0.5393	0.5381	0.1164	- 2	-71
9 Aquarii	7.0	+1.82	+14.0	-13 54.1	18 47.2	+ 2 37.3	+0.0482	0.5379	+0.1171	+30	-32
18 Aquarii	5.4	1.69	13.9	13 17.2	3 6 20.3	-10 10.8	+0.7947	0.5333	0.1290	+77	+11
$\gamma$ Capricorni	5.4	1.56	13.3	11 48.3	17 43.7	+ 0 52.1	+0.6914	0.5293	0.1393	+77	+ 4
B. A. C. 7620	6.5	1.52	12.9	10 45.6	21 22.1	+ 4 24.0	+0.0502	0.5282	0.1423	+33	-31
B. A. C. 7697	6.8	1.44	12.8	10 54.7	4 4 26.5	+11 15.0	+1.2443	0.5261	0.1478	+79	+49
36 Aquarii	6.3	+1.44	+12.0	- 8 39.3	5 34.4	-11 38.3	-1.0829	0.5258	+0.1486	-34	-90
$\theta$ Aquarii	4.3	1.40	11.8	8 15.5	9 24.6	- 7 54.9	-0.9457	0.5248	0.1513	-23	-90
B. A. C. 7774	6.2	1.39	12.2	9 30.9	9 26.1	- 7 53.3	+0.4479	0.5248	0.1513	+59	-10
$\rho$ Aquarii	5.4	1.38	11.7	8 18.0	11 10.3	- 6 12.3	-0.6318	0.5244	0.1525	- 3	-81
B. A. C. 7804	6.2	1.37	11.1	7 40.6	12 55.3	- 4 30.2	-1.0541	0.5240	0.1537	-31	-90
W. B. xxii, 493	6.2	+1.32	+11.0	- 7 2.5	16 58.6	- 0 34.1	-1.1276	0.5231	+0.1562	-37	-90
67 Aquarii	6.2	1.25	11.0	7 27.8	23 14.8	+ 5 31.1	+0.3288	0.5220	0.1598	+52	-16
B. A. C. 7986	5.8	1.20	10.0	5 29.8	5 33.1	+11 38.6	-0.8268	0.5211	0.1630	-13	-90
B. A. C. 7993	6.6	1.19	9.8	5 19.2	6 39.9	-11 16.5	-0.8397	0.5210	0.1635	-14	-90
B. A. C. 8017	6.1	1.17	9.7	5 13.6	8 54.2	- 9 6.1	-0.5771	0.5207	0.1645	+ 1	-74
B. A. C. 8094	5.6	+1.10	+ 8.9	- 4 1.0	16 20.3	- 1 52.8	-0.6770	0.5202	+0.1676	- 4	-85
11 Piscium	6.5	1.04	7.8	2 19.1	23 41.5	+ 5 15.7	-1.3108	0.5200	0.1700	-59	-90
W. B. xxiii, 1069	6.9	0.89	6.2	- 0 48.8	6 15 43.7	- 3 10.9	-0.2099	0.5210	0.1733	+23	-46
B. A. C. 57	7.0	0.82	4.8	+ 1 9.4	7 1 12.3	+ 6 2.3	-0.7239	0.5225	0.1740	- 6	87
44 Piscium	5.8	0.78	4.4	1 24.6	5 11.7	+ 9 54.8	-0.3062	0.5233	0.1741	+17	-53
B. A. C. 167	7.5	+0.75	+ 3.6	+ 2 35.9	12 21.1	- 6 58.3	-0.3627	0.5251	+0.1736	+14	-56
B. A. C. 237	6.7	0.67	2.8	2 51.9	18 39.3	- 1 1.3	+0.4386	0.5269	0.1728	+62	-10
B. A. C. 243	7.3	0.67	2.5	3 34.0	19 41.8	- 0 0.6	-0.1464	0.5272	0.1726	+26	-42
73 Piscium	6.4	0.64	1.5	5 8.5	8 1 37.1	+ 5 44.1	-0.8425	0.5292	0.1712	-13	-85
77 Piscium	6.1	0.62	1.7	4 23.9	2 6.3	+ 6 12.3	+0.0505	0.5294	0.1711	+37	-31
$\epsilon$ Piscium	5.7	+0.61	+ 1.3	+ 5 8.5	3 25.2	+ 7 29.0	-0.5341	0.5299	+0.1708	+ 5	-68
B. A. C. 410	7.4	0.58	0.2	6 54.6	10 47.6	- 9 21.9	-1.1986	0.5329	0.1684	-42	-83
96 Piscium	6.6	0.55	0.0	6 47.9	13 52.6	- 6 22.5	-0.5597	0.5341	0.1671	+ 3	-70
$\mu$ Piscium	5.2	0.54	+ 0.3	5 39.0	14 26.3	+ 5 49.9	+0.7774	0.5344	0.1669	+90	+10
$\nu$ Piscium	4.4	0.50	- 1.1	8 40.5	22 1.1	+ 1 31.0	-1.2362	0.5379	0.1633	-47	-82
65 Ceti	4.5	+0.38	- 2.3	+ 8 23.8	9 11 33.2	- 9 22.3	+1.2102	0.5448	+0.1549	+90	+47
$\epsilon$ Arietis	5.4	0.36	3.3	10 10.5	17 13.2	- 3 53.1	+0.1806	0.5467	0.1502	+45	-21
B. A. C. 755	7.0	0.35	3.3	10 7.9	18 8.9	- 2 59.2	+0.3656	0.5486	0.1499	+57	11
25 Arietis	7.3	0.34	3.4	9 46.3	18 28.1	- 2 40.6	+0.7089	0.5488	0.1496	+90	+15
31 Arietis	5.6	0.35	4.2	12 1.8	22 48.3	+ 1 31.2	-0.9675	0.5513	0.1459	-23	-78
38 Arietis	5.2	+0.31	- 4.5	+12 2.4	10 2 44.1	+ 5 19.3	-0.4107	0.5536	+0.1423	+11	-55

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1904.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
W. B. ii, 1033	5.9	+0.24	- 5.4	+12 49.0	10 12 40.8	- 9 3.7	+0.1344	0.5597	+0.1321	+42	-21
B. A. C. 987	6.3	0.24	5.5	12 40.9	14 57.6	- 6 51.5	+0.5734	0.5611	+0.1296	+74	+3
NEW MOON.											
B. A. C. 2432	7.0	0.05	10.1	18 27.3	15 0 6.6	- 1 36.7	-0.7697	0.6002	-0.0571	-10	-72
W. B. (2) vii, 685	5.6	+0.07	-10.2	+17 17.3	3 37.5	+ 1 46.0	+0.1950	0.5998	-0.0640	+46	-11
f Geminorum	5.2	0.08	10.0	17 53.5	6 41.9	+ 4 43.3	-0.6187	0.5996	0.0700	- 1	-63
1 Cancri	5.9	0.12	10.2	16 2.6	13 46.7	+11 31.7	+0.6980	0.5981	0.0835	+90	+16
B. A. C. 2649	6.3	0.12	10.0	16 46.5	14 23.2	-11 53.2	-0.0887	0.5979	0.0846	+29	-29
3 Cancri	6.0	0.12	9.8	17 34.2	15 17.4	-11 1.2	-0.9667	0.5977	0.0863	-24	-72
5 Cancri	6.4	+0.13	-10.0	+16 43.0	15 35.5	-10 43.7	-0.1344	0.5977	-0.0868	+27	-31
29 Cancri	5.9	0.21	10.1	14 31.6	16 2 37.5	- 0 7.3	+1.0016	0.5948	0.1064	+90	+34
2 Leonis	5.2	0.45	9.8	11 43.4	17 4 50.7	+ 1 6.8	+0.4884	0.5856	0.1456	+67	- 2
B. A. C. 3398	6.0	0.57	9.8	9 23.1	15 12.8	+11 6.0	+1.2634	0.5817	0.1578	+90	+55
A Leonis	4.6	0.64	9.2	10 27.9	20 5.8	- 8 11.6	-0.6058	0.5798	0.1628	+ 1	-71
B. A. C. 3538	7.0	+0.69	- 9.1	+ 9 26.8	18 2 15.6	- 2 15.2	-0.6017	0.5775	-0.1685	+ 1	-72
44 Leonis	6.2	0.71	9.1	9 16.2	3 33.6	- 1 0.0	-0.6451	0.5770	0.1696	- 2	-76
48 Leonis	5.2	0.77	9.4	7 26.7	7 42.6	+ 3 0.1	+0.4818	0.5756	0.1729	+65	- 6
37 Sextantis	6.2	0.83	9.3	6 52.6	12 37.3	+ 7 44.3	+0.1967	0.5739	0.1765	+46	22
56 Leonis	6.6	0.88	9.0	6 41.6	16 58.1	+11 55.8	-0.3939	0.5725	0.1792	+13	-57
82 Leonis	6.9	+1.07	- 8.9	+ 3 49.6	19 6 3.0	+ 0 33.3	+0.1145	0.5688	-0.1853	+41	-27
83 Leonis	6.1	1.05	8.9	3 32.0	6 34.2	+ 1 3.4	+0.3151	0.5686	0.1855	+53	-16
7 Leonis	5.1	1.08	9.0	3 22.9	7 3.6	+ 1 31.8	+0.3773	0.5685	0.1856	+57	-13
W. B. xi, 349	5.1	1.09	9.0	3 21.4	7 4.0	+ 1 32.2	+0.4019	0.5685	0.1856	+59	-12
89 Leonis	6.2	1.11	8.7	3 35.5	9 55.7	+ 4 17.8	-0.3676	0.5678	0.1865	+14	-56
$\beta$ Virginis	3.7	+1.25	- 8.6	+ 2 18.2	17 10.4	+11 17.5	-0.4207	0.5663	-0.1880	+11	-60
13 Virginis	6.3	1.41	8.1	- 0 15.4	20 5 46.3	- 0 32.7	-0.1963	0.5643	0.1883	+23	-46
$\eta$ Virginis	4.1	1.41	8.1	0 8.1	6 19.9	- 0 0.2	-0.4241	0.5642	0.1882	+11	-61
38 Virginis	6.2	1.64	7.4	3 2.0	21 22.1	- 9 28.8	-0.2814	0.5630	0.1848	+18	-51
$\lambda$ Virginis	5.9	1.68	7.0	3 17.8	21 0 17.1	- 6 39.7	-0.5507	0.5629	0.1836	+ 4	-71
46 Virginis	6.1	+1.68	- 6.9	- 2 51.3	0 42.6	- 6 15.1	-1.0805	0.5629	-0.1835	-30	-90
48 Virginis	6.6	1.70	6.9	3 8.9	2 12.5	- 4 48.2	-1.0546	0.5629	0.1828	- 2	-90
51 Virginis	4.4	1.76	7.2	5 1.7	4 56.1	- 2 10.2	+0.3714	0.5629	0.1816	+56	-14
66 Virginis	5.8	1.84	6.3	4 39.9	11 32.4	+ 4 12.6	-1.1907	0.5630	0.1780	-42	-90
$\zeta$ Virginis	6.1	1.89	6.4	5 58.6	14 11.7	+ 6 46.5	-0.3159	0.5631	0.1764	+16	-53
$\zeta^2$ Virginis	4.9	+1.89	- 6.2	- 5 45.7	14 53.9	+ 7 27.3	-0.6601	0.5631	-0.1759	- 3	-83
77 Virginis	7.0	1.92	6.6	7 7.9	15 32.5	+ 8 4.6	+0.6327	0.5631	0.1755	+76	+ 1
81 Virginis	7.0	1.95	6.4	7 23.0	17 25.6	+ 9 53.8	+0.5627	0.5632	0.1743	+70	- 3
82 Virginis	5.3	1.97	6.4	8 13.2	19 14.7	+11 39.2	+1.1068	0.5634	0.1728	+82	+33
B. A. C. 4647	6.4	2.04	5.4	7 35.3	22 1 17.3	- 6 30.7	-0.5751	0.5638	0.1684	0	-74
94 Virginis	6.8	+2.12	- 5.0	- 8 26.1	6 22.9	- 1 35.5	-0.5496	0.5643	-0.1640	+ 1	-71
95 Virginis	5.7	2.14	5.4	8 51.4	6 34.4	- 1 24.4	-0.1461	0.5643	0.1639	+24	-43
96 Virginis	6.5	2.16	5.3	9 52.9	7 35.6	- 0 25.3	+0.7441	0.5644	0.1629	+78	+ 7
$\kappa$ Virginis	4.3	2.17	4.9	9 49.7	9 20.6	+ 1 16.1	+0.4060	0.5646	0.1613	+56	-12
2 Libræ	6.3	2.25	4.7	11 16.6	14 4.1	+ 5 49.9	+1.1521	0.5652	0.1567	+79	+38
B. A. C. 4772	6.6	+2.26	- 4.6	-11 14.1	14 38.2	+ 6 22.8	+1.0205	0.5652	-0.1562	+79	+26
B. A. C. 4828	6.0	2.30	3.8	11 53.9	20 11.8	+11 45.0	+0.8559	0.5659	0.1503	+78	+15
$\epsilon^1$ Libræ	5.9	2.40	2.7	11 30.5	23 3 56.7	- 4 46.2	-0.6803	0.5670	0.1415	- 9	-87
$\alpha^2$ Libræ	6.3	2.59	1.5	14 47.5	16 40.4	+ 7 31.2	+1.0398	0.5687	0.1252	+75	+29
$\gamma$ Libræ	4.0	2.63	0.4	14 28.2	22 13.5	-11 7.3	+0.0304	0.5695	0.1175	+29	-33
B. A. C. 5188	6.6	+2.69	- 0.2	-14 44.1	24 1 43.4	- 7 44.7	-0.0940	0.5699	-0.1125	+21	-40
$\eta$ Libræ	5.5	2.68	0.0	15 22.0	2 0.4	- 7 28.3	+0.5354	0.5700	0.1120	+60	- 4
$\theta$ Libræ	4.3	2.74	+ 0.6	16 26.9	6 18.2	- 3 19.5	+1.2006	0.5704	0.1056	+74	+46
49 Libræ	5.6	2.74	1.0	16 15.0	9 12.9	- 0 30.9	+0.6937	0.5708	0.1012	+72	+ 5
$\phi$ Ophiuchi	4.4	2.84	3.3	16 24.2	22 47.3	-11 24.9	-0.3741	0.5718	0.0795	+ 2	-58
24 Scorpii	5.2	+2.90	+ 3.9	-17 33.3	25 3 22.1	- 6 59.8	+0.4954	0.5720	-0.0720	+53	- 6



## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1904.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	$\gamma$	$x'$	$y'$	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m				°	°
B. A. C. 5695	6.2	+2.90	+ 5.1	-16 39.2	25 9 45.1	- 0 50.2	-0.8852	0.5721	-0.0612	-30	-90
B. A. C. 5771	6.2	2.94	5.9	17 28.8	15 7.8	+ 4 21.2	-0.3128	0.5720	0.0519	+ 3	-54
B. A. C. 5839	6.0	2.96	6.8	17 39.3	20 16.1	+ 9 18.7	-0.3725	0.5718	0.0429	- 1	-58
B. A. C. 6060	6.5	3.01	9.3	18 47.0	26 12 12.6	+ 0 41.9	+0.3701	0.5701	-0.0148	+39	-13
B. A. C. 6101	7.3	3.00	9.7	18 39.2	22 23.4	+10 31.6	+0.1735	0.5682	+0.0031	+26	-24
Y Sagittarii	Var	+3.00	+11.0	18 54.0	23 34.7	+11 40.4	+0.4427	0.5679	+0.0052	+43	- 9
B. A. C. 6267	6.7	2.98	11.4	17 51.4	27 2 32.6	- 9 27.9	-0.6560	0.5673	0.0103	-21	-86
B. A. C. 6287	6.0	2.99	11.6	18 47.2	3 32.3	- 8 30.2	+0.3553	0.5670	0.0120	+38	-14
B. A. C. 6294	5.2	2.99	11.7	18 27.9	4 6.3	- 7 57.4	+0.0174	0.5668	0.0130	+17	-33
$\rho^1$ Sagittarii	3.9	2.90	14.5	18 1.5	28 2 59.6	9 50.6	+0.2823	0.5599	0.0511	+37	-18
$\rho^2$ Sagittarii	6.1	+2.91	+14.5	-18 29.0	3 3.6	- 9 46.8	+0.7826	0.5599	+0.0512	+72	+11
B. A. C. 6658	7.0	2.89	14.9	18 33.0	5 56.9	- 6 59.2	+1.0108	0.5588	0.0558	+72	+28
B. A. C. 6710	6.0	2.87	15.3	18 26.4	10 7.0	- 2 57.3	+1.1400	0.5573	0.0623	+72	+40
$\rho^4$ Sagittarii	5.6	2.84	15.3	16 30.6	11 51.4	- 1 16.5	-0.8483	0.5566	0.0649	-27	-90
$\rho^5$ Sagittarii	5.0	2.83	15.4	16 20.7	12 41.9	0 27.6	-0.9722	0.5562	0.0662	-35	-90
$\rho^6$ Sagittarii	5.0	+2.78	+15.9	-15 44.5	19 57.7	+ 6 33.9	-1.1113	0.5534	+0.0769	-46	-90
B. A. C. 6992	6.2	2.71	16.6	15 5.0	29 6 50.2	- 6 54.7	-0.9143	0.5488	0.0920	-28	-90
$\beta$ Capricorni	3.4	2.70	16.7	15 4.8	6 56.6	- 6 48.3	-0.9975	0.5488	0.0922	-28	-90
Lalande 39247	7.4	2.68	16.8	15 17.3	9 22.8	4 27.0	-0.4518	0.5478	0.0953	0	-64
$\gamma^1$ Capricorni	7.0	2.65	17.2	15 28.5	14 49.9	+ 0 49.8	+0.2914	0.5455	0.1023	+43	-18
$\gamma^2$ Capricorni	5.3	+2.64	+17.2	-15 17.2	15 46.1	+ 1 44.2	+0.1817	0.5451	+0.1035	+36	-24
W. B. xx, 1293	6.0	2.56	17.6	14 51.0	30 1 17.0	+10 57.7	+0.7422	0.5411	0.1148	+73	+ 8
8 Aquarii	6.8	2.54	17.3	13 25.8	1 54.7	+11 33.6	-0.7469	0.5408	0.1155	-15	-90
9 Aquarii	7.0	2.54	17.5	13 54.1	2 30.4	-11 51.8	-0.1604	0.5405	0.1161	+18	-44
18 Aquarii	5.4	2.44	17.7	13 17.1	13 59.7	- 0 43.7	+0.5676	0.5359	0.1282	+65	- 3
W. B. xxi, 749	6.3	+2.37	+17.2	-11 0.2	21 44.5	+ 6 47.1	-0.9272	0.5329	+0.1356	-24	-90

JULY.

$\lambda$ Capricorni	5.4	+2.36	+17.4	-11 48.3	1 1 19.6	+10 15.7	+0.4476	0.5316	+0.1387	+58	- 9
B. A. C. 7620	6.5	+2.30	+17.2	-10 45.6	4 57.0	-10 13.4	-0.1984	0.5303	+0.1418	+19	-46
B. A. C. 7697	6.8	2.24	17.2	10 54.6	11 59.7	- 3 23.2	+0.9877	0.5280	0.1473	+79	-24
$\mu$ Aquarii	4.3	2.20	16.4	8 15.4	6 57.0	+ 1 25.3	-1.2093	0.5264	0.1508	-46	-90
B. A. C. 7774	6.2	2.19	16.8	9 30.8	16 58.3	+ 1 26.6	+0.1850	0.5264	0.1508	+42	-24
$\rho$ Aquarii	5.4	2.18	16.5	8 17.9	18 42.2	+ 3 7.4	-0.8977	0.5260	0.1520	-20	-90
B. A. C. 7804	6.2	+2.17	+16.2	- 7 40.5	20 26.9	+ 4 49.1	-1.3223	0.5255	+0.1532	-68	-90
67 Aquarii	6.2	2.07	15.9	7 27.7	2 6 45.5	- 9 10.5	+0.0523	0.5229	0.1593	+35	-31
B. A. C. 7986	5.8	2.02	15.1	5 29.7	13 3.7	- 3 3.1	-1.1100	0.5216	0.1625	-34	-90
B. A. C. 7993	6.6	2.01	15.0	5 19.2	14 10.5	- 1 58.3	-1.1229	0.5214	0.1630	-35	-90
B. A. C. 8017	6.1	1.99	14.8	5 13.5	16 25.0	+ 0 12.3	-0.8621	0.5210	0.1640	-16	-90
B. A. C. 8094	5.6	+1.92	+14.1	- 4 1.0	23 51.9	+ 7 26.3	-0.9670	0.5200	+0.1670	-22	-90
20 Piscium	5.7	1.76	12.9	3 17.5	3 17 4.6	+ 0 9.6	+1.1501	0.5189	0.1717	+87	+36
W. B. xxiii, 1069	6.9	1.72	11.6	- 0 48.7	23 22.8	+ 6 17.0	-0.5043	0.5191	0.1726	+ 6	-67
B. A. C. 57	7.0	1.65	10.2	+ 1 9.5	4 8 56.4	- 8 25.9	-1.0203	0.5198	0.1733	-26	-89
44 Piscium	5.8	1.61	9.8	1 24.6	12 58.4	- 4 30.8	-0.5991	0.5200	0.1732	+ 1	-76
B. A. C. 167	7.5	+1.58	+ 8.9	+ 2 36.0	20 12.8	+ 2 31.0	-0.6534	0.5215	+0.1728	- 2	-81
B. A. C. 237	6.7	1.49	8.1	2 52.0	5 2 35.7	+ 8 42.8	+0.1550	0.5229	0.1719	+43	-24
B. A. C. 243	7.3	1.49	7.8	3 34.1	3 39.2	+ 9 44.5	-0.4321	0.5232	0.1716	+11	-61
73 Piscium	6.4	1.45	6.7	5 8.6	9 39.5	- 8 25.7	-1.1283	0.5248	0.1704	-35	-85
77 Piscium	6.1	1.44	6.8	4 23.9	10 9.1	- 7 57.0	-0.2298	0.5250	0.1703	+22	-47
$\epsilon$ Piscium	5.7	+1.43	+ 6.4	+ 5 8.6	11 29.2	- 6 39.2	-0.8167	0.5254	+0.1699	-12	-85
96 Piscium	6.6	1.35	4.9	6 48.0	22 6.5	+ 3 39.2	-0.8329	0.5290	0.1663	-13	-83
$\mu$ Piscium	5.2	1.34	5.3	5 39.0	22 40.7	+ 4 12.4	+0.5128	0.5292	0.1661	+68	- 5
64 Ceti	5.7	1.16	2.4	8 7.3	6 19 21.2	+ 0 15.1	+1.1574	0.5386	0.1550	+90	+40
65 Ceti	4.5	1.16	2.2	8 23.8	20 9.4	+ 1 1.8	+0.9838	0.5390	0.1544	+90	+26
$\xi$ Arietis	5.4	+1.13	+ 1.0	+10 10.6	7 1 55.4	+ 6 36.9	-0.0522	0.5422	+0.1503	+31	-34

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1904.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	y'	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
B. A. C. 755	7.0	+1.11	+0.9	+10 8.0	7 2 52.1	+ 7 31.8	+0.1350	0.5427	+0.1496	+42	-23
25 Arietis	7.3	1.09	+0.9	9 46.3	3 11.7	+ 7 50.8	+0.5716	0.5429	0.1493	+74	- 1
31 Arietis	5.6	1.10	-0.2	12 1.9	7 36.4	-11 52.9	-1.1988	0.5454	0.1457	-43	-78
38 Arietis	5.2	1.05	0.6	12 2.5	11 36.3	- 8 0.7	-0.6317	0.5478	0.1422	- 1	-72
W. B. ii, 1033	5.9	0.97	1.9	12 49.0	21 43.0	+ 1 46.4	-0.0656	0.5540	0.1324	+30	-32
B. A. C. 987	6.3	+0.95	-1.9	+12 41.0	8 0 2.0	+ 4 0.8	+0.3799	0.5556	+0.1299	+58	- 8
W. B. (2) iv, 59	6.4	0.72	5.8	17 1.7	9 3 28.7	+ 6 31.1	-1.0823	0.5739	0.0943	-33	-73
48 Tauri	6.4	0.69	5.5	15 9.6	4 55.3	+ 7 54.6	+1.0014	0.5747	0.0921	+90	+35
5 Tauri	3.9	0.68	5.8	15 23.7	6 39.8	+ 9 35.4	+0.9135	0.5758	0.0894	+90	+29
55 Tauri	7.3	0.69	6.0	16 17.4	6 42.1	+ 9 37.6	-0.0142	0.5759	0.0894	+33	-24
d Tauri	4.0	+0.68	-6.3	+17 19.0	7 59.5	+10 52.2	-0.9676	0.5768	+0.0874	-24	-73
63 Tauri	5.6	0.67	6.1	16 33.1	8 12.8	+11 5.0	-0.1542	0.5769	0.0870	+25	-32
d Tauri	4.7	0.68	6.3	17 13.2	8 29.7	+11 21.3	-0.8240	0.5771	0.0865	-14	-72
d Tauri	4.2	0.68	6.5	17 42.4	9 5.3	+11 55.7	-1.2784	0.5775	0.0856	-63	-73
70 Tauri	6.3	0.66	6.0	15 43.2	9 10.5	-11 59.4	+0.7931	0.5775	0.0855	+90	+22
71 Tauri	6.0	+0.65	-6.0	+15 23.9	9 29.6	-11 40.9	+1.1539	0.5777	+0.0850	+90	+50
75 Tauri	5.3	0.65	6.2	16 8.6	10 23.2	-10 49.3	+0.4553	0.5783	0.0836	+64	+ 2
h Tauri	3.9	0.65	6.1	15 44.9	10 26.7	-10 45.9	+0.8714	0.5783	0.0834	+90	+27
h Tauri	3.6	0.65	6.1	15 39.4	10 29.1	-10 43.6	+0.9687	0.5784	0.0834	+90	+34
80 Tauri	5.6	0.64	6.1	15 25.6	11 7.5	-10 6.6	+1.2603	0.5788	0.0824	+90	+64
B. A. C. 1391	5.0	+0.64	-6.2	+15 59.0	11 17.7	- 9 56.7	+0.6063	0.5789	+0.0821	+90	+16
81 Tauri	5.5	0.64	6.1	15 28.9	11 20.4	- 9 54.1	+1.2211	0.5789	0.0820	+90	+58
B. A. C. 1394	7.5	0.64	6.2	15 56.4	11 23.3	- 9 51.3	+0.7497	0.5789	0.0819	+90	+19
85 Tauri	6.5	0.63	6.2	15 38.6	11 51.5	- 9 24.2	+1.0943	0.5793	0.0812	+90	+44
B. A. C. 1406	7.5	0.63	6.4	16 7.2	12 36.8	- 8 40.4	+0.6620	0.5797	0.0799	+86	+14
a Tauri	1.0	+0.62	-6.6	+16 18.9	13 35.0	- 7 44.3	+0.5355	0.5803	+0.0783	+71	+ 7
89 Tauri	6.5	0.61	6.5	15 50.4	14 32.6	- 6 48.9	+1.1019	0.5809	0.0767	+90	+46
9 Tauri	4.8	0.61	6.5	15 43.6	15 1.4	- 6 21.1	+1.2555	0.5812	0.0759	+90	+64
B. A. C. 1526	5.8	0.56	7.3	17 0.1	22 38.8	+ 0 59.5	+0.4639	0.5859	0.0627	+65	+ 5
104 Tauri	5.1	0.55	7.9	18 30.9	10 2 48.2	+ 4 59.7	-0.8477	0.5884	0.0552	-16	-71
111 Tauri	5.2	+0.47	-8.1	+17 17.5	9 51.0	+11 46.6	+0.7488	0.5922	+0.0420	+90	+24
115 Tauri	5.4	0.46	8.3	17 52.7	10 58.7	-11 8.3	+0.5954	0.5928	0.0399	+46	- 8
117 Tauri	6.3	0.45	8.2	17 9.4	11 20.4	-10 47.4	+0.9470	0.5930	0.0391	+90	+36
W. B. (2) v, 606	7.0	0.45	8.4	18 17.1	11 51.2	-10 17.8	-0.1872	0.5932	0.0373	+23	-29
119 Tauri	4.6	0.45	8.5	18 31.2	13 1.9	- 9 9.7	-0.3837	0.5938	0.0359	+12	-42
120 Tauri	5.3	+0.44	-8.5	+18 28.2	13 34.0	- 8 38.8	-0.3126	0.5941	+0.0348	+16	-37
122 Tauri	5.4	0.42	8.4	16 58.7	15 2.0	- 7 14.2	+1.2581	0.5948	0.0320	+90	+68
B. A. C. 1796	7.5	0.42	8.8	18 56.3	17 12.3	- 5 8.8	-0.6752	0.5958	0.0277	- 5	-66
127 Tauri	6.3	0.42	8.8	18 55.9	17 22.4	- 4 59.2	-0.6637	0.5959	+0.0274	- 4	-64
NEW MOON.											
$\xi$ Leonis	5.2	+0.34	-8.7	+11 43.4	14 12 36.7	+10 40.5	+0.6373	0.5954	-0.1462	+81	+ 6
A Leonis	4.6	0.45	8.1	10 28.0	15 3 23.7	+ 0 54.0	-0.4147	0.5896	0.1640	+11	-56
B. A. C. 3538	7.0	0.51	7.8	9 26.8	9 22.1	+ 6 38.9	-0.4005	0.5872	0.1698	+12	-56
44 Leonis	6.2	0.52	7.8	9 16.3	10 37.8	+ 7 51.8	-0.4415	0.5867	0.1710	+10	-59
48 Leonis	5.2	+0.56	-7.9	+ 7 26.7	14 39.3	+11 44.4	+0.6764	0.5851	-0.1744	+85	+ 5
37 Sextantis	6.2	0.61	7.7	6 52.6	19 25.3	- 7 40.1	+0.4020	0.5831	0.1780	+59	-11
56 Leonis	6.6	0.65	7.5	6 41.8	23 38.4	- 3 36.3	-0.1748	0.5815	0.1809	+24	-43
82 Leonis	6.9	0.80	7.2	3 49.7	16 12 21.7	+ 8 39.5	+0.3420	0.5768	0.1870	+55	-14
83 Leonis	6.1	0.79	7.1	3 32.1	12 52.1	+ 9 8.7	+0.5406	0.5767	0.1872	+70	- 4
$\tau$ Leonis	5.1	+0.82	-7.2	+ 3 23.0	13 20.8	+ 9 36.4	+0.6024	0.5765	-0.1874	+76	- 1
W. B. xi, 349	5.1	0.82	7.2	3 21.4	13 21.2	+ 9 36.8	+0.6267	0.5765	0.1874	+79	+ 1
89 Leonis	6.2	0.84	7.0	3 35.5	16 8.4	-11 42.0	-0.1301	0.5755	0.1882	+27	-41
$\beta$ Virginis	3.7	0.97	6.8	+ 2 18.2	23 12.8	- 4 52.7	-0.1783	0.5733	0.1896	+24	-45
13 Virginis	6.3	1.11	6.3	- 0 15.3	17 11 32.5	+ 7 1.0	+0.0510	0.5699	0.1898	+37	-31
$\eta$ Virginis	4.1	+1.12	-6.2	- 0 8.1	12 5.4	+ 7 32.8	-0.1743	0.5698	-0.1897	+24	-44

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

THE STAR'S				AT CONJUNCTION IN R. A.							Limiting Parallels.	
Name.	Mag.	Red'ns from 1904.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	I'	x'	y'	N.	S.	
		$\Delta\alpha$	$\Delta\delta$									
		s	"		d h m	h m						
$\gamma$ Virginis (mean)	2.8	+1.22	-5.4	-0 55.4	17 21 45.7	-7 7.1	-1.2079	0.5677	-0.1878	-43	-90	
38 Virginis	6.2	1.32	5.6	3 2.0	18 2 52.7	-2 10.8	-0.0300	0.5669	0.1862	+32	-36	
$\lambda$ Virginis	5.9	1.38	5.5	3 17.8	5 45.4	+0 35.9	-0.2976	0.5664	0.1848	+17	-52	
46 Virginis	6.1	1.38	5.0	2 51.2	6 10.7	+1 0.3	-0.8242	0.5663	0.1847	-12	-90	
48 Virginis	6.6	1.39	5.0	3 8.9	7 39.4	+2 26.0	-0.7985	0.5661	0.1840	-11	-90	
51 Virginis	4.4	+1.45	-5.4	-5 1.7	10 21.1	+5 2.1	+0.6179	0.5657	-0.1827	+76	0	
66 Virginis	5.8	1.54	4.5	4 39.8	16 53.5	+11 21.0	-0.9369	0.5650	0.1790	-20	-90	
$\zeta^1$ Virginis	6.1	1.58	4.6	5 58.6	19 31.7	-10 6.2	-0.0683	0.5648	0.1773	+30	-38	
$\zeta^2$ Virginis	4.9	1.59	4.5	5 45.7	20 13.5	-9 25.8	-0.4099	0.5647	0.1769	+11	-60	
77 Virginis	7.0	1.62	4.8	7 7.9	20 51.8	-8 48.8	+0.8756	0.5647	0.1764	+83	+16	
81 Virginis	7.0	+1.65	-4.7	-7 23.0	22 44.1	-7 0.4	+0.8055	0.5646	-0.1751	+83	+11	
B. A. C. 4647	6.4	1.74	3.8	7 35.2	19 6 33.5	+0 32.8	-0.3318	0.5642	0.1691	+14	-54	
94 Virginis	6.8	1.83	3.4	8 26.1	11 38.4	+5 27.3	-0.3103	0.5640	0.1647	+15	-53	
95 Virginis	5.7	1.85	3.8	8 51.4	11 49.9	+5 38.3	+0.0921	0.5641	0.1645	+37	-29	
96 Virginis	6.5	1.87	3.7	9 52.9	12 51.0	+6 37.4	+0.9794	0.5640	0.1636	+80	+23	
$\kappa$ Virginis	4.3	+1.89	-3.4	-9 49.7	14 35.9	+8 18.7	+0.6410	0.5641	-0.1619	+75	+1	
B. A. C. 4772	6.6	1.98	3.2	11 14.1	19 53.7	-10 34.4	+1.2504	0.5641	0.1567	+79	+50	
B. A. C. 4828	6.0	2.04	2.4	11 53.9	20 1 28.0	-5 11.5	+1.0816	0.5642	0.1509	+78	+31	
$\xi^1$ Libræ	5.9	2.16	1.4	11 30.4	9 15.0	+2 19.5	-0.4626	0.5645	0.1420	+4	-64	
$\xi^2$ Libræ	5.8	2.16	1.1	11 1.4	10 19.6	+3 21.9	-1.1187	0.5645	0.1407	-39	-90	
$\rho^2$ Libræ	6.3	+2.37	-0.6	-14 47.5	22 4.3	-9 17.5	+1.2430	0.5652	-0.1257	+75	+51	
$\gamma$ Libræ	4.0	2.43	+0.5	14 28.2	21 3 40.7	-3 52.8	+0.2249	0.5655	0.1181	+40	-22	
B. A. C. 5188	6.6	2.49	0.6	14 44.1	7 12.8	-0 28.0	+0.0953	0.5658	0.1130	+32	-29	
$\eta$ Libræ	5.5	2.49	0.8	15 22.0	7 29.9	-0 11.5	+0.7263	0.5658	0.1126	+75	+7	
49 Libræ	5.6	2.57	1.5	16 15.0	14 47.6	+6 51.2	+0.8742	0.5662	0.1019	+74	+17	
$\phi$ Ophiuchi	4.4	+2.74	+4.0	-16 24.2	22 4 32.6	-3 52.3	-0.2195	0.5669	-0.0806	+11	-48	
24 Scorpii	5.2	2.80	4.4	17 33.3	9 11.3	+0 36.8	+0.6461	0.5670	0.0728	+66	+3	
B. A. C. 5695	6.2	2.84	5.8	16 39.1	15 39.8	+6 52.0	-0.7523	0.5670	0.0624	-21	-90	
B. A. C. 5771	6.2	2.90	6.4	17 28.8	21 7.3	-11 51.8	-0.1869	0.5670	0.0532	+10	-45	
B. A. C. 5839	6.0	2.95	7.3	17 39.3	23 2 20.0	-6 49.9	-0.2564	0.5667	0.0444	+5	-50	
B. A. C. 6060	6.5	+3.07	+9.7	-18 47.0	18 30.3	+8 47.1	+0.4596	0.5655	-0.0160	+46	-8	
B. A. C. 6201	7.3	3.11	11.3	18 39.2	24 4 49.2	-5 15.1	+0.2415	0.5640	+0.0011	+29	-20	
$\gamma$ Sagittarii	Var.	3.12	11.4	18 54.0	6 1.4	-4 5.4	+0.5102	0.5639	0.0032	+48	-5	
B. A. C. 6267	6.7	3.11	12.1	17 51.3	9 1.5	-1 11.4	-0.6001	0.5634	0.0083	-18	-79	
B. A. C. 6287	6.0	3.14	12.1	18 47.2	10 1.9	-0 13.1	+0.4144	0.5632	0.0100	+41	-11	
B. A. C. 6294	5.2	+3.13	+12.2	-18 27.9	10 36.3	+0 20.1	+0.0737	0.5631	+0.0109	+20	-30	
$\rho^1$ Sagittarii	3.9	3.16	15.4	18 1.4	25 9 43.8	-1 18.9	+0.2936	0.5576	0.0490	+37	-17	
$\rho^2$ Sagittarii	6.1	3.17	15.3	18 28.9	9 47.8	-1 15.0	+0.7959	0.5576	0.0491	+72	+12	
B. A. C. 6658	7.0	3.17	15.7	18 33.0	12 42.7	+1 34.1	+1.0193	0.5568	0.0536	+71	+29	
B. A. C. 6710	6.0	3.17	16.2	18 26.4	16 54.7	+5 37.9	+1.1405	0.5558	0.0601	+72	+40	
$\epsilon^1$ Sagittarii	5.6	+3.14	+16.5	-16 30.6	18 39.8	+7 19.5	-0.8594	0.5549	+0.0627	-28	-90	
$\epsilon^2$ Sagittarii	5.0	3.14	16.7	16 20.7	19 30.6	+8 8.6	-0.9848	0.5546	0.0640	-36	-90	
$\zeta$ Sagittarii	5.0	3.12	17.4	15 44.5	26 2 49.0	-8 47.3	-1.1395	0.5523	0.0748	-49	-90	
B. A. C. 6992	6.2	3.10	18.3	15 5.0	13 44.3	+1 47.0	-0.9625	0.5485	0.0900	-32	-90	
$\zeta^1$ Capricorni	3.4	3.09	18.4	15 4.8	13 51.2	+1 53.6	-0.9563	0.5484	0.0902	-32	-90	
Lalande 39247	7.4	+3.09	+18.6	-15 17.3	16 17.6	+4 15.4	-0.5039	0.5482	+0.0934	-3	-68	
$\tau^1$ Capricorni	7.0	3.08	19.0	15 28.5	21 45.6	+9 33.0	+0.2308	0.5456	0.1004	+39	-21	
$\tau^2$ Capricorni	5.3	3.07	19.1	15 17.2	22 42.0	+10 27.6	+0.1190	0.5452	0.1016	+32	-27	
W. B. xx, 1293	6.0	3.03	19.7	14 50.9	27 8 14.2	-4 18.0	+0.6623	0.5418	0.1131	+72	+3	
8 Aquarii	6.8	3.02	19.7	13 25.8	8 51.4	-3 42.0	-0.8315	0.5415	0.1138	-20	-90	
9 Aquarii	7.0	+3.02	+19.7	-13 54.0	9 27.2	-3 7.1	-0.2445	0.5414	+0.1147	+14	-49	
18 Aquarii	5.4	2.97	20.2	13 17.1	20 56.5	+8 0.8	+0.4637	0.5376	0.1268	+57	-8	
W. B. xxi, 749	6.3	2.92	20.2	11 0.2	28 4 40.8	-8 29.1	-1.0479	0.5344	0.1343	-33	-90	
$\gamma$ Capricorni	5.4	2.90	20.4	11 48.2	8 15.6	-5 0.7	+0.3234	0.5332	0.1375	+48	-16	
B. A. C. 7620	6.5	2.88	20.3	10 45.5	11 52.7	-1 30.1	-0.3301	0.5320	0.1406	+12	-55	
B. A. C. 7697	6.8	+2.84	+20.4	-10 54.6	18 54.7	+5 19.3	+0.8466	0.5297	+0.1462	+79	+14	

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1904.0.		Apparent Declination.	Washington Mean Time.	Hour Angle. H	J'	J''	J'''	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	"	°	d h m	h m				°	°
B. A. C. 7774	6.2	+2.81	+20.3	- 9 30.8	28 23 52.7	+10 8.4	+0.0344	0.5282	+0.1498	+33	-32
$\rho$ Aquarii	5.4	2.80	20.1	8 17.9	29 1 36.5	+11 49.3	-1.0526	0.5277	0.1510	-31	-90
67 Aquarii	6.2	2.72	19.8	7 27.6	13 38.4	- 0 29.9	-0.1186	0.5247	0.1586	+26	-41
B. A. C. 7986	5.8	2.69	19.2	5 29.7	19 56.2	+ 5 37.0	-1.2924	0.5233	0.1617	-57	-90
B. A. C. 7993	6.6	2.68	19.1	5 19.1	21 3.0	+ 6 41.8	-1.3076	0.5229	0.1623	-60	-90
B. A. C. 8017	6.1	+2.66	+19.1	- 5 13.4	23 17.3	+ 8 52.2	-1.0490	0.5225	+0.1632	-29	-90
B. A. C. 8094	5.6	2.62	18.5	4 0.9	30 6 44.0	- 7 54.0	-1.1629	0.5212	0.1663	-39	-90
20 Piscium	5.7	2.50	17.5	3 17.4	23 57.9	+ 8 50.4	+0.9428	0.5193	0.1709	+87	+20
W.B.xliii,1069	6.9	2.47	16.4	- 0 48.6	31 6 17.3	- 9 1.0	-0.7232	0.5190	0.1718	- 6	-90
B. A. C. 57	7.0	2.37	15.2	+ 1 9.5	15 53.6	+ 0 18.9	-1.2486	0.5192	0.1724	-47	-89
44 Piscium	5.8	+2.38	+14.8	+ 1 24.7	19 57.0	+ 4 15.4	-0.8286	0.5194	+0.1724	-12	-89

AUGUST.

B. A. C. 167	7.5	+2.31	+13.9	+ 2 36.1	1 3 14.7	+11 20.5	-0.8868	0.5204	+0.1718	-16	-87
B. A. C. 237	6.7	+2.28	+13.1	+ 2 52.1	9 41.2	- 6 24.1	-0.0759	0.5210	+0.1709	+30	-38
B. A. C. 243	7.3	2.28	12.8	3 34.2	10 45.3	- 5 21.8	-0.6670	0.5212	0.1707	- 3	-83
77 Piscium	6.1	2.24	11.9	4 24.0	17 19.5	+ 1 1.0	-0.4651	0.5224	0.1691	+ 9	-63
$\epsilon$ Piscium	5.7	2.23	11.5	5 8.7	18 40.5	+ 2 19.6	-1.0564	0.5227	0.1688	-29	-85
96 Piscium	6.6	2.16	9.9	6 48.1	2 5 26.4	-11 13.4	-1.0740	0.5255	0.1651	-30	-83
$\mu$ Piscium	5.2	+2.15	+10.2	+ 5 39.1	6 1.1	-10 39.7	+0.2819	0.5256	+0.1649	+51	-17
64 Ceti	5.7	1.98	7.0	8 7.4	3 3.2	+ 9 44.7	+0.9380	0.5333	0.1537	+90	+22
65 Ceti	4.5	1.97	6.9	8 23.9	3 52.3	+10 32.4	+0.7632	0.5336	0.1532	+90	+11
$\xi$ Arietis	5.4	1.95	5.5	10 10.6	9 45.4	- 7 45.3	-0.2798	0.5363	0.1490	+19	-47
B. A. C. 755	7.0	1.94	5.5	10 8.1	10 43.3	- 6 49.1	-0.0903	0.5368	0.1483	+29	-36
25 Arietis	7.3	+1.92	+ 5.4	+ 9 46.4	11 3.4	- 6 29.7	+0.3509	0.5369	+0.1480	+56	-11
38 Arietis	5.2	1.88	3.7	12 2.6	19 39.2	+ 1 50.1	-0.8588	0.5412	0.1410	-15	-78
W. B. ii, 1033	5.9	1.78	2.2	12 49.1	4 6 0.2	+11 51.3	-0.2793	0.5469	0.1313	+19	-45
B. A. C. 987	6.3	1.77	+ 2.1	12 41.1	8 22.6	- 9 50.8	+0.1729	0.5483	0.1289	+44	-19
W. B. (2) iv, 59	6.4	1.51	- 2.9	17 1.8	5 12 30.9	- 6 38.7	-1.2738	0.5658	0.0941	-60	-73
48 Tauri	6.4	+1.45	- 2.6	+15 9.6	13 59.6	- 5 13.1	+0.8324	0.5667	+0.0919	+90	+23
$\gamma$ Tauri	3.9	1.45	2.8	15 23.7	15 46.7	- 3 29.8	+0.7458	0.5679	0.0893	+90	+18
55 Tauri	7.3	1.46	3.1	16 17.4	15 49.2	- 3 27.3	-0.1911	0.5679	0.0892	+23	-35
$\delta^1$ Tauri	4.0	1.46	3.5	17 19.0	17 8.5	- 2 10.8	-1.1521	0.5687	0.0873	-41	-73
63 Tauri	5.6	1.44	3.3	16 33.1	17 22.1	- 1 57.6	-0.3297	0.5689	0.0869	+16	-43
$\delta^2$ Tauri	4.7	+1.45	- 3.6	+17 13.2	17 39.4	- 1 41.0	-1.0063	0.5691	+0.0865	-29	-73
70 Tauri	6.3	1.42	3.2	15 43.3	18 21.3	- 1 0.6	+0.6277	0.5696	0.0854	+81	+12
71 Tauri	6.0	1.41	3.1	15 24.0	18 40.8	- 0 41.7	+0.9925	0.5698	0.0849	+90	+35
75 Tauri	5.3	1.41	3.4	16 8.7	19 35.7	+ 0 11.2	+0.2883	0.5703	0.0835	+52	- 7
$\theta^1$ Tauri	3.9	1.41	3.3	15 44.9	19 39.4	+ 0 14.9	+0.7084	0.5704	0.0834	+90	+16
$\theta^2$ Tauri	3.6	+1.40	- 3.3	+15 39.5	19 41.7	+ 0 17.1	+0.8065	0.5704	+0.0834	+90	+23
80 Tauri	5.6	1.39	3.3	15 25.7	20 21.1	+ 0 55.1	+1.1018	0.5708	0.0823	+90	+45
B. A. C. 1391	5.0	1.40	3.5	15 59.1	20 31.6	+ 1 5.2	+0.5326	0.5709	0.0821	+71	+ 6
81 Tauri	5.5	1.39	3.5	15 28.9	20 34.4	+ 1 7.9	+1.0621	0.5710	0.0820	+90	+41
B. A. C. 1394	7.5	1.39	3.5	15 56.4	20 37.4	+ 1 10.8	+0.5868	0.5710	0.0819	+76	+10
85 Tauri	6.5	+1.39	- 3.5	+15 38.7	21 6.3	+ 1 38.7	+0.9354	0.5713	+0.0812	+90	+31
B. A. C. 1406	7.5	1.38	3.7	16 7.2	21 52.7	+ 2 23.4	+0.4998	0.5718	0.0800	+68	+ 5
$\alpha$ Tauri	1.0	1.38	3.9	16 18.9	22 52.4	+ 3 21.1	+0.3737	0.5724	0.0784	+58	- 2
89 Tauri	6.5	1.36	3.9	15 50.7	23 51.3	+ 4 17.8	+0.9465	0.5731	0.0769	+90	+33
$\alpha^2$ Tauri	4.8	1.35	3.8	15 43.6	24 0.8	+ 4 46.3	+1.1023	0.5734	0.0761	+90	+45
B. A. C. 1526	5.8	+1.30	- 5.1	+17 0.1	8 9.1	-11 42.2	+0.3141	0.5783	+0.0632	+54	- 4
104 Tauri	5.1	1.28	5.9	18 30.9	12 24.1	- 7 36.4	-1.0027	0.5809	0.0559	-27	-71
111 Tauri	5.2	1.17	6.2	17 17.6	19 35.9	- 0 40.5	+0.6178	0.5852	0.0430	+81	+15
115 Tauri	5.4	1.15	6.5	17 52.7	20 45.0	+ 0 26.0	+0.0614	0.5859	0.0408	+38	-15
117 Tauri	6.3	1.14	6.4	17 9.4	21 7.2	+ 0 47.4	+0.8199	0.5861	0.0402	+90	+28
W. B. (2) v, 606	7.0	+1.14	6.7	+18 17.2	21 38.5	+ 1 17.6	-0.3223	0.5864	+0.0392	+16	-38

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

THE STAR'S				AT CONJUNCTION IN R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1904.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
119 Tauri	4.6	+1.13	-6.9	+18 31.3	6 22 50.6	+ 2 27.0	-0.5183	0.5871	+0.0370	+ 5	-52
120 Tauri	5.3	1.12	6.9	18 28.2	23 23.6	+ 2 58.8	-0.4457	0.5873	0.0359	+ 8	-46
122 Tauri	5.4	1.09	6.7	16 58.8	7 0 53.2	+ 4 25.0	+1.1387	0.5881	0.0331	+90	+53
B. A. C. 1796	7.5	1.08	7.4	18 56.3	3 5.9	+ 6 32.8	-0.8047	0.5893	0.0289	-13	-71
127 Tauri	6.3	1.08	7.3	18 55.9	3 16.2	+ 6 42.6	-0.7928	0.5897	0.0286	-12	-71
130 Tauri	5.5	+1.05	-7.2	+17 41.5	5 10.0	+ 8 32.1	+0.5297	0.5904	+0.0249	+72	+12
71 Orionis	5.1	0.93	8.5	19 11.2	16 20.6	- 4 42.7	-0.8405	0.5958	+0.0028	-15	-71
W.B.(2), vi, 286	6.5	0.90	8.1	17 21.6	18 3.8	- 3 3.5	+1.0182	0.5966	-0.0006	+90	+46
20 Geminorum	6.3	0.85	8.5	17 50.7	23 23.9	+ 2 4.3	+0.4919	0.5987	0.0115	+68	+11
21 Geminorum	6.5	0.85	8.5	17 51.0	23 24.2	+ 2 4.6	+0.4869	0.5987	0.0115	+67	+11
22 Geminorum	7.2	+0.85	-8.9	+19 30.1	8 0 19.1	+ 2 57.3	-1.1960	0.5991	-0.0134	-48	-71
26 Geminorum	5.1	0.81	8.7	17 44.2	3 27.0	+ 5 57.9	+0.5362	0.6002	0.0199	+72	+13
W.B.(2), vi, 1630	6.2	0.74	9.1	17 53.4	11 25.2	-10 22.7	+0.1568	0.6026	0.0364	+43	-10
2 Geminorum	3.6	0.68	9.1	16 42.7	17 38.8	- 4 23.8	+1.0704	0.6040	0.0493	+90	+46
B. A. C. 2432	7.0	0.67	9.4	18 27.3	19 35.3	- 2 31.9	-0.7757	0.6043	0.0532	-11	-72
W.B.(2), vii, 685	5.6	+0.64	-9.3	+17 17.3	23 2.7	+ 0 47.3	+0.1954	0.6050	-0.0604	+46	-10
NEW MOON.											
82 Leonis	6.9	0.65	6.0	3 49.7	12 21 1.7	- 4 52.6	+0.4555	0.5871	0.1890	+63	- 9
83 Leonis	6.1	0.62	5.9	3 32.1	21 31.0	- 4 24.4	+0.6523	0.5869	0.1891	+81	+ 2
7 Leonis	5.1	0.66	6.0	3 23.0	21 58.8	- 3 57.7	+0.7138	0.5868	0.1893	+90	+ 6
W. B. xi, 349	5.1	+0.66	-6.0	+ 3 21.5	21 59.2	- 3 57.3	+0.7377	0.5868	-0.1893	+90	+ 7
89 Leonis	6.2	0.67	5.8	3 35.5	18 0 41.1	- 1 21.5	-0.0049	0.5859	0.1903	+34	-34
3 Virginis	3.7	0.77	5.5	+ 2 18.3	7 31.5	+ 5 13.8	-0.0428	0.5837	0.1919	+32	-36
13 Virginis	6.3	0.86	4.8	- 0 15.3	19 27.0	- 7 16.8	+0.1960	0.5803	0.1923	+46	-23
7 Virginis	4.1	0.86	4.7	0 8.1	19 58.8	- 6 46.1	-0.0252	0.5802	0.1923	+33	-35
7 Virginis (mean)	2.8	+0.93	-3.9	- 0 55.4	14 5 20.1	+ 2 15.0	-1.0342	0.5778	-0.1903	-27	-90
38 Virginis	6.2	1.02	3.9	3 2.0	10 17.3	+ 7 1.5	+0.1298	0.5766	0.1885	+41	-27
4 Virginis	5.9	1.06	3.9	3 17.7	13 4.6	+ 9 42.9	-0.1319	0.5761	0.1874	+26	-42
46 Virginis	6.1	1.06	3.5	2 51.2	13 29.0	+10 6.3	-0.6502	0.5760	0.1872	- 2	-81
48 Virginis	6.6	1.08	3.4	3 8.9	14 55.0	+11 29.3	-0.6245	0.5757	0.1865	- 1	-78
51 Virginis	4.4	+1.13	-3.7	- 5 1.7	17 31.8	- 9 59.5	+0.7731	0.5752	-0.1852	+85	+ 9
66 Virginis	5.8	1.20	2.8	4 39.8	23 52.4	- 3 52.5	-0.7554	0.5738	0.1813	- 9	-90
11 Virginis	6.1	1.25	2.9	5 58.5	15 2 25.9	- 1 24.4	+0.1022	0.5736	0.1796	+39	-28
12 Virginis	4.9	1.25	2.8	5 45.7	3 6.7	- 0 45.1	-0.2359	0.5735	0.1792	+20	-48
77 Virginis	7.0	1.27	3.1	7 7.8	3 43.8	- 0 9.3	+1.0333	0.5734	0.1787	+83	+27
81 Virginis	7.0	+1.30	-3.0	- 7 23.0	5 32.9	+ 1 35.9	+0.9651	0.5731	-0.1774	+83	+22
B. A. C. 4647	6.4	1.40	2.1	7 35.2	13 9.7	+ 8 56.6	-0.1548	0.5720	0.1712	+24	-43
94 Virginis	6.8	1.46	1.8	8 26.1	18 6.7	-10 16.8	-0.1322	0.5714	0.1667	+24	-42
95 Virginis	5.7	1.48	2.2	8 51.4	18 17.9	-10 6.1	+0.2651	0.5714	0.1665	+47	-19
96 Virginis	6.5	1.50	2.1	9 52.8	19 17.5	- 9 8.5	+1.1418	0.5713	0.1655	+80	+37
8 Virginis	4.3	+1.52	-1.7	- 9 49.7	20 59.8	- 7 29.8	+0.8080	0.5711	-0.1639	+80	+12
B. A. C. 4828	6.0	1.64	-0.9	11 16.6	16 7 37.4	+ 2 45.4	+1.2450	0.5701	0.1525	+79	+49
51 Libræ	5.9	1.77	0.0	11 30.4	15 15.3	+10 7.2	-0.2834	0.5695	0.1434	+14	-51
52 Libræ	5.8	1.78	+0.4	11 1.3	16 18.7	+11 8.4	-0.9332	0.5694	0.1421	-25	-90
17 Libræ	7.2	1.78	0.5	10 46.2	16 58.7	+11 47.0	-1.2887	0.5694	0.1413	-62	-90
7 Libræ	4.0	+2.06	+1.6	-14 28.2	17 9 24.4	+ 3 38.3	+0.3926	0.5684	-0.1191	+50	-12
B. A. C. 5188	6.6	2.12	1.7	14 44.1	12 54.1	+ 7 0.7	+0.2628	0.5683	0.1140	+42	-19
7 Libræ	5.5	2.11	1.8	15 22.0	13 11.1	+ 7 17.2	+0.8888	0.5682	0.1136	+75	+18
48 Libræ	4.8	2.17	3.3	14 0.1	19 27.8	-10 39.2	-1.2212	0.5679	0.1042	-55	-90
49 Libræ	5.6	2.20	2.4	16 15.0	20 24.6	- 9 44.5	+1.0330	0.5678	0.1028	+74	+29
φ Ophiuchi	4.4	+2.39	+4.7	-16 24.2	18 10 4.7	+ 3 27.2	-0.0630	0.5671	-0.0813	+20	-38
24 Scorpii	5.2	2.46	5.0	17 33.3	14 42.5	+ 7 55.3	+0.7959	0.5667	0.0738	+72	+12
B. A. C. 5695	6.2	2.52	6.3	16 39.1	21 10.4	- 9 50.1	-0.6027	0.5662	0.0631	-12	-78
B. A. C. 5771	6.2	2.60	6.9	17 28.8	19 2 37.8	- 4 34.0	-0.0434	0.5658	0.0540	+19	-37
B. A. C. 5839	6.0	2.65	7.6	17 39.2	7 51.0	+ 0 28.5	-0.1173	0.5652	0.0452	+13	-41
B. A. C. 6060	6.5	+2.83	+9.7	-18 47.0	20 0 4.7	- 7 51.2	+0.5832	0.5630	-0.0176	+56	- 1

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Parallels.	
Name.	Mag.	Red'ns from 1904.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, //	Y'	x'	y'	N.	S.		
		$\Delta\alpha$	$\Delta\delta$										
B. A. C. 6086	6.1	s	"		d h m	h m							
B. A. C. 6201	7.3	+2.83	+10.6	-17 9.0	20 2 35.3	- 5 25.7	-1.2109	0.5626	-0.0133	-63	-90		
Y Sagittarii	Var.	2.93	11.3	18 39.2	10 27.3	+ 2 10.3	+0.3549	0.5611	0.0000	+36	-14		
B. A. C. 6267	6.7	2.93	11.4	18 54.0	11 40.0	+ 3 20.5	+0.6225	0.5610	+0.0020	+58	+ 2		
B. A. C. 6287	6.0	2.93	12.1	17 51.3	14 41.3	+ 6 15.7	-0.4920	0.5604	0.0071	-12	-68		
B. A. C. 6287	6.0	2.96	12.1	18 47.2	15 42.2	+ 7 14.6	+0.5225	0.5602	+0.0088	+50	- 4		
B. A. C. 6294	5.2	+2.95	+12.2	-18 27.9	16 16.9	+ 7 48.1	+0.1808	0.5602	+0.0098	+28	-24		
$\rho^1$ Sagittarii	3.9	3.09	15.2	18 1.4	21 15 35.3	+ 6 20.1	+0.3752	0.5544	0.0475	+42	-13		
$\rho^2$ Sagittarii	6.1	3.10	15.3	18 28.9	15 39.3	+ 6 24.0	+0.8782	0.5544	0.0476	+72	+18		
B. A. C. 6658	7.0	3.11	15.7	18 33.0	18 35.6	+ 9 14.5	+1.0989	0.5536	0.0521	+71	+36		
B. A. C. 6710	6.0	3.13	16.1	18 26.4	22 49.6	-10 39.7	+1.2154	0.5525	0.0585	+72	+50		
$\epsilon^1$ Sagittarii	5.6	+3.11	+16.7	-16 30.6	22 0 35.7	- 8 57.2	-0.7910	0.5519	+0.0612	-24	-90		
$\epsilon^2$ Sagittarii	5.0	3.11	16.9	16 20.7	1 27.0	- 8 7.6	-0.9184	0.5517	0.0625	-32	-90		
$\delta$ Sagittarii	5.0	3.12	17.7	15 44.5	8 48.7	- 1 0.2	-1.0818	0.5495	0.0732	-44	-90		
B. A. C. 6992	6.2	3.15	18.7	15 5.0	19 49.0	+ 9 39.2	-0.9184	0.5462	0.0884	-28	-90		
$\beta$ Capricorni	3.4	3.15	18.9	15 4.8	19 55.9	+ 9 45.8	-0.9117	0.5461	0.0885	-27	-90		
Lalande 39247	7.4	+3.16	+19.1	-15 17.3	22 23.3	-11 51.4	-0.4612	0.5454	+0.0918	- 1	-65		
$\tau^1$ Capricorni	7.0	3.17	19.4	15 28.5	23 3 53.3	- 6 31.9	+0.2684	0.5436	0.0988	+41	-18		
$\tau^2$ Capricorni	5.3	3.17	19.6	15 17.2	4 50.1	- 5 36.9	+0.1552	0.5434	0.1000	+34	-25		
W. B. xx, 1293	6.0	3.18	20.3	14 50.9	14 25.6	+ 3 40.8	+0.6880	0.5402	0.1115	+74	+ 5		
8 Aquarii	6.8	3.17	20.5	13 25.8	15 2.9	+ 4 16.9	-0.8101	0.5401	0.1122	-19	-90		
9 Aquarii	7.0	+3.17	+20.5	-13 54.0	15 38.9	+ 4 51.8	-0.2225	0.5399	+0.1129	+15	-47		
18 Aquarii	5.4	3.17	21.2	13 17.1	24 3 11.2	- 7 57.1	+0.4732	0.5363	0.1254	+58	- 8		
W. B. xxi, 749	6.3	3.15	21.7	11 0.2	10 56.9	- 0 25.5	-1.0512	0.5340	0.1329	-34	-90		
$\lambda$ Capricorni	5.4	3.15	21.7	11 48.2	14 32.3	+ 3 3.5	+0.3187	0.5330	0.1362	+48	-16		
B. A. C. 7620	6.5	3.15	21.9	10 45.5	18 9.7	+ 6 34.4	-0.3409	0.5319	0.1394	+11	-55		
B. A. C. 7697	6.8	+3.14	+22.0	-10 54.5	25 1 12.4	-10 35.5	+0.8299	0.5300	+0.1451	+79	+13		
B. A. C. 7774	6.2	3.13	22.1	9 30.8	6 10.6	- 5 46.2	+0.0105	0.5288	0.1489	+32	-33		
$\rho$ Aquarii	5.4	3.12	22.1	8 17.8	7 54.3	- 4 5.5	-1.0804	0.5283	0.1501	-34	-90		
67 Aquarii	6.2	3.10	22.0	7 27.6	19 56.2	+ 7 35.3	-0.1583	0.5256	0.1577	+24	-43		
$\gamma$ Aquarii	3.8	3.08	21.9	8 5.1	26 0 51.7	-11 37.8	+1.3201	0.5247	0.1604	+82	+63		
B. A. C. 8017	6.1	+3.08	+21.7	- 5 13.4	5 34.6	- 7 3.0	-1.0995	0.5238	+0.1627	-33	-90		
B. A. C. 8094	5.6	3.06	21.4	4 0.8	13 0.6	+ 0 10.2	-1.2220	0.5227	0.1658	-45	-90		
20 Piscium	5.7	3.00	20.5	3 17.3	27 6 13.0	- 7 7.1	+0.8715	0.5210	0.1706	+87	+15		
W. B. xxiii, 1069	6.9	3.00	19.8	- 0 47.5	12 31.8	- 0 59.0	-0.8031	0.5207	0.1716	-11	-90		
B. A. C. 57	7.0	2.98	18.9	+ 1 9.6	22 7.7	+ 8 20.5	-1.3377	0.5207	0.1722	-68	-89		
44 Piscium	5.8	+2.95	+18.5	+ 1 24.8	28 2 11.1	-11 43.1	-0.9195	0.5208	+0.1721	-19	-89		
B. A. C. 167	7.5	2.97	17.8	2 36.2	9 28.9	- 4 37.8	-0.9834	0.5212	0.1715	-23	-87		
B. A. C. 237	6.7	2.90	16.9	2 52.1	15 55.9	+ 1 38.0	-0.1740	0.5218	0.1706	+24	-44		
B. A. C. 243	7.5	2.91	16.7	3 34.2	17 0.1	+ 2 40.4	-0.7679	0.5220	0.1704	- 9	-86		
77 Piscium	6.1	2.88	15.8	4 24.1	23 35.4	+ 9 4.3	-0.5689	0.5229	0.1688	+ 3	-72		
$\epsilon$ Piscium	5.7	+2.88	+15.5	+ 5 8.8	29 0 56.7	+10 23.3	-1.1630	0.5231	+0.1684	-38	-85		
96 Piscium	6.6	2.84	13.9	6 48.1	11 45.4	- 3 6.9	-1.1864	0.5249	0.1646	-41	-83		
$\mu$ Piscium	5.2	2.83	14.2	5 39.2	12 20.2	- 2 33.0	+0.1757	0.5253	0.1644	+44	-23		
64 Ceti	5.7	2.72	10.9	8 7.4	30 9 33.0	- 5 57.8	+0.8318	0.5314	0.1529	+90	+15		
65 Ceti	4.5	2.71	10.8	8 24.0	10 22.7	- 5 9.8	+0.6556	0.5316	0.1523	+82	+ 5		
$\xi$ Arietis	5.4	+2.70	+ 9.5	+10 10.7	16 20.0	+ 0 36.8	-0.3958	0.5337	+0.1481	+13	-55		
B. A. C. 755	7.0	2.69	9.4	10 8.2	17 18.7	+ 1 33.7	-0.2048	0.5341	0.1473	+23	-43		
25 Arietis	7.3	2.67	9.3	9 46.5	17 39.0	+ 1 53.4	+0.2397	0.5342	0.1471	+48	-18		
38 Arietis	5.2	2.66	7.6	12 2.6	31 2 22.3	+10 20.7	-0.9806	0.5377	0.1400	-24	-78		
W. B. ii, 1033	5.9	2.56	5.8	12 49.1	12 54.0	- 3 27.3	-0.3957	0.5422	0.1302	+12	-53		
B. A. C. 987	6.3	+2.55	+ 5.7	+12 41.1	15 19.0	- 1 6.8	+0.0609	0.5435	+0.1278	+38	-25		
W. B. iii, 275	6.2	+2.48	+ 4.8	+12 17.4	21 29.7	+ 4 52.2	+1.2548	0.5465	+0.1212	+90	+58		

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1904.0.		Apparent Declination	Washington Mean Time.	Hour Angle. H	J'	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
48 Tauri	6.4	+2.28	+ 0.3	+15 9.7	1 21 37.6	+ 4 12.5	+0.7364	0.5991	+0.0909	+90	+18
$\gamma$ Tauri	3.9	2.26	- 0.1	15 23.8	23 27.7	+ 5 58.9	+0.6497	0.5601	0.0883	+84	+12
55 Tauri	7.3	2.28	0.4	16 17.5	23 30.1	+ 6 1.2	-0.2996	0.5601	0.0882	+17	-41
$\delta^1$ Tauri	4.0	2.28	0.9	17 19.0	2 0 51.7	+ 7 20.1	-1.2721	0.5609	0.0863	-61	-73
63 Tauri	5.6	2.26	0.7	16 33.2	1 5.6	+ 7 33.6	-0.4393	0.5610	0.0860	+ 9	-50
$\delta^2$ Tauri	4.7	+2.27	- 1.0	+17 13.3	1 23.4	+ 7 50.7	-1.1245	0.5611	+0.0855	-38	-73
70 Tauri	6.3	2.23	0.6	15 43.3	2 6.5	+ 8 32.3	+0.5310	0.5615	0.0845	+71	+ 6
71 Tauri	6.0	2.23	0.5	15 24.0	2 26.5	+ 8 51.7	+0.9006	0.5617	0.0840	+90	+29
75 Tauri	5.3	2.22	0.9	16 8.7	3 23.0	+ 9 46.3	+0.1875	0.5622	0.0826	+47	-13
$\theta^1$ Tauri	3.9	2.22	0.8	15 44.9	3 26.7	+ 9 49.9	+0.6132	0.5623	0.0825	+79	+11
$\theta^2$ Tauri	3.6	+2.22	- 0.7	+15 39.5	3 29.2	+ 9 52.3	+0.7125	0.5623	+0.0825	+90	+17
80 Tauri	5.6	2.21	0.7	15 25.7	4 9.6	+10 31.2	+1.0120	0.5627	0.0815	+90	+37
B. A. C. 1391	5.0	2.21	1.0	15 59.1	4 20.4	+10 41.7	+0.4355	0.5628	0.0812	+63	+ 1
81 Tauri	5.5	2.20	0.8	15 29.0	4 23.3	+10 44.5	+0.9724	0.5628	0.0812	+90	+34
B. A. C. 1394	7.5	2.21	0.9	15 56.5	4 26.3	+10 47.4	+0.4904	0.5628	0.0810	+67	+ 4
85 Tauri	6.5	+2.19	- 0.9	+15 38.7	4 56.1	+11 16.2	+0.8438	0.5631	+0.0803	+90	+25
B. A. C. 1406	7.5	2.20	1.2	16 7.2	5 43.8	-11 57.8	+0.4029	0.5636	0.0790	+60	- 1
$\alpha$ Tauri	1.0	2.19	1.5	16 19.0	6 45.2	-10 58.4	+0.2755	0.5641	0.0776	+51	- 8
89 Tauri	6.5	2.17	1.4	15 50.5	7 45.9	- 9 59.8	+0.8566	0.5647	0.0760	+90	+26
$\sigma^2$ Tauri	4.8	2.16	1.4	15 43.7	8 16.1	- 9 30.6	+1.0144	0.5649	0.0753	+90	+38
B. A. C. 1526	5.8	+2.08	- 3.0	+17 0.1	16 18.4	- 1 45.1	+0.2200	0.5694	+0.0626	+48	- 9
104 Tauri	5.1	2.08	4.1	18 30.9	20 41.1	+ 2 28.4	-1.1132	0.5716	0.0554	-37	-71
111 Tauri	5.2	1.95	4.6	17 17.6	3 4.3	+ 9 37.7	+0.5336	0.5756	0.0427	+71	+11
115 Tauri	5.4	1.93	5.0	17 52.7	5 17.5	+10 46.4	-0.0294	0.5762	0.0406	+32	-21
117 Tauri	6.3	1.92	4.8	17 9.5	5 40.4	+11 8.4	+0.7394	0.5764	0.0399	+90	+23
W. B. (2) v, 606	7.0	+1.93	- 5.2	+18 17.2	6 12.8	+11 39.7	-0.4184	0.5767	+0.0390	+10	-45
119 Tauri	4.6	1.91	5.5	18 31.3	7 27.2	-11 8.6	-0.6164	0.5773	0.0368	- 1	-60
120 Tauri	5.3	1.90	5.5	18 28.2	8 1.1	-10 35.9	-0.5426	0.5776	0.0358	+ 3	-54
122 Tauri	5.4	1.86	5.2	16 58.8	9 33.5	- 9 6.8	+1.0648	0.5784	0.0330	+90	+46
B. A. C. 1796	7.5	1.86	6.2	19 56.3	11 50.5	- 6 54.9	-0.9044	0.5795	0.0289	-20	-71
127 Tauri	6.3	+1.86	- 6.2	+18 55.9	12 1.1	- 6 44.6	-0.8923	0.5796	+0.0286	-19	-71
130 Tauri	5.5	1.81	5.9	17 41.5	13 58.1	+ 4 51.5	+0.4497	0.5803	0.0250	+64	+ 8
71 Orionis	5.1	1.67	7.8	19 11.2	4 1 30.2	+ 6 14.7	-0.9320	0.5859	+0.0034	-22	-71
W. B. (2) vi, 286	6.5	1.63	7.3	17 21.7	3 16.6	+ 7 57.1	+0.9529	0.5866	0.0000	+90	+40
20 Geminorum	6.3	1.57	8.0	17 50.7	8 46.7	-10 45.1	+0.4231	0.5889	-0.0105	+62	+ 8
21 Geminorum	6.5	+1.57	- 8.0	+17 51.0	8 46.9	-10 44.9	+0.4190	0.5888	-0.0108	+62	+ 7
26 Geminorum	5.1	1.51	8.4	17 44.2	12 57.1	- 6 44.0	+0.4707	0.5905	0.0189	+66	+10
W. B. (2) vi, 1630	6.2	1.40	9.1	17 53.4	21 9.3	+ 1 9.4	+0.0920	0.5932	0.0351	+40	-14
$\lambda$ Geminorum	3.6	1.31	9.1	16 42.7	5 3 33.2	+ 7 18.7	+1.0211	0.5951	0.0478	+90	+41
B. A. C. 2432	7.0	1.30	9.7	18 27.3	5 32.9	+ 9 13.8	-0.8451	0.5956	0.0518	-15	-72
W. B. (2) vii, 685	5.6	+1.24	- 9.6	+17 17.3	9 5.7	-11 21.6	+0.1397	0.5965	-0.0588	+43	-13
$\rho$ Geminorum	5.2	1.21	9.9	17 53.5	12 11.2	- 8 23.3	-0.6591	0.5971	0.0649	- 4	-68
1 Cancri	5.9	1.11	9.7	16 2.6	19 16.1	- 1 34.8	+0.6901	0.5984	0.0786	+90	+16
B. A. C. 2649	6.3	1.11	9.9	16 46.5	19 52.4	- 0 59.9	-0.0910	0.5985	0.0798	+29	-27
3 Cancri	6.0	1.10	10.1	17 34.2	20 46.3	- 0 8.1	-0.9601	0.5986	0.0815	-24	-72
5 Cancri	6.4	+1.09	- 9.9	+16 43.0	21 4.3	+ 0 9.2	-0.1305	0.5987	-0.0821	+27	-30
29 Cancri	5.9	0.97	9.7	14 31.6	6 7 58.7	+10 38.1	+1.0495	0.5998	0.1024	+90	+38
$\epsilon$ Leonis	5.2	0.75	9.0	+11 43.4	9 23.8	+11 3.9	+0.6566	0.5970	0.1445	+83	+ 8
NEW MOON.											
$\lambda$ Virginis	5.9	+0.86	- 2.9	- 3 17.7	10 22 46.4	- 2 47.3	-0.0898	0.5855	-0.1900	+28	-39
46 Virginis	6.1	0.85	2.6	2 51.2	23 10.1	- 2 24.6	-0.6009	0.5854	0.1896	0	-76
48 Virginis	6.6	0.86	2.6	3 8.9	11 0 33.6	- 1 4.2	-0.5744	0.5852	0.1891	+ 2	-73
51 Virginis	4.4	0.90	2.6	5 1.6	3 5.7	+ 1 22.3	+0.8048	0.5849	0.1878	+75	+11
66 Virginis	5.8	0.94	1.9	4 39.8	9 14.7	+ 7 17.7	-0.7002	0.5840	0.1842	- 6	-88
$\lambda$ Virginis	6.1	+0.97	- 1.8	- 5 58.5	11 43.4	+ 9 41.0	+0.1462	0.5837	-0.1824	+42	-26

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.											
SEPTEMBER.											
THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1904.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
$\beta$ Virginis	4.9	+0.96	- 1.7	- 5 45.6	11 12 22.8	+10 19.0	-0.1863	0.5836	-0.1822	+23	-45
77 Virginis	7.0	0.99	1.9	7 7.8	12 58.8	+10 53.7	+1.0644	0.5835	0.1816	+83	+29
80 Virginis	5.8	0.98	1.4	4 54.5	13 53.0	+11 45.9	-1.3067	0.5834	0.1809	-60	-90
81 Virginis	7.0	1.01	1.8	7 23.0	14 44.5	-11 24.6	+0.9975	0.5833	0.1802	+83	+24
B. A. C. 4647	6.4	1.06	0.9	7 35.2	22 6.5	- 4 18.7	-0.1034	0.5824	0.1740	+26	-40
94 Virginis	6.8	+1.12	- 0.5	- 8 26.0	12 2 53.9	+ 0 18.3	-0.0801	0.5818	-0.1694	+27	-39
95 Virginis	5.7	1.14	0.8	8 51.3	3 4.7	+ 0 28.6	+0.3113	0.5818	0.1692	+50	-18
96 Virginis	6.5	1.16	0.7	9 52.8	4 2.4	+ 1 24.3	+1.1746	0.5817	0.1683	+80	+40
$\kappa$ Virginis	4.3	1.17	- 0.4	9 49.6	5 41.4	+ 2 59.6	+0.8461	0.5815	0.1666	+80	+14
B. A. C. 4828	6.0	1.25	+ 0.5	11 53.8	15 58.1	-11 6.1	+1.2785	0.5803	0.1551	+78	+55
$\xi$ Libræ	5.9	+1.37	+ 1.3	-11 30.4	23 21.2	- 3 59.0	-0.2257	0.5795	-0.1458	+17	-48
$\zeta$ Libræ	5.8	1.37	1.5	11 1.3	13 0 22.6	- 2 59.9	-0.8656	0.5793	0.1445	-20	-90
17 Libræ	7.2	1.37	1.7	10 46.1	1 1.2	- 2 22.7	-1.2154	0.5793	0.1436	-50	-90
18 Libræ	6.2	1.37	1.7	10 45.5	1 17.6	- 2 6.9	-1.2655	0.5793	0.1433	-57	-90
$\gamma$ Libræ	4.0	1.61	2.7	14 28.1	16 56.6	-11 1.8	+0.4415	0.5778	0.1211	+54	- 9
B. A. C. 5188	6.6	+1.66	+ 2.8	-14 44.1	20 20.2	- 7 45.5	+0.3129	0.5769	-0.1158	+44	-16
$\eta$ Libræ	5.5	1.66	2.9	15 22.0	20 36.7	- 7 29.6	+0.9304	0.5769	0.1154	+75	+21
48 Libræ	4.8	1.71	4.2	14 0.1	14 2 42.9	- 1 36.5	-1.1511	0.5763	0.1058	-47	-90
49 Libræ	5.6	1.72	3.3	16 15.0	3 38.1	- 0 43.3	+1.0728	0.5760	0.1043	+74	+32
$\phi$ Ophiuchi	4.4	1.91	5.4	16 24.1	16 57.3	-11 52.6	-0.0097	0.5739	0.0824	+23	-34
24 Scorpii	5.2	+1.98	+ 5.6	-17 33.3	21 28.7	- 7 30.8	+0.8388	0.5731	-0.0748	+72	+15
B. A. C. 5695	6.2	2.04	6.8	16 39.1	15 3 48.1	- 1 24.8	-0.5451	0.5719	0.0639	- 9	-72
B. A. C. 5771	6.2	2.12	7.2	17 28.8	9 9.2	+ 3 44.9	+0.0070	0.5704	0.0546	+20	-34
B. A. C. 5839	6.0	2.20	7.9	17 39.2	14 16.6	+ 8 41.6	-0.0671	0.5697	0.0458	+16	-38
B. A. C. 6060	6.5	2.37	9.7	18 47.0	16 6 15.8	+ 0 7.4	+0.6240	0.5658	0.0179	+60	+ 2
B. A. C. 6086	6.1	+2.37	+10.6	-17 9.0	8 44.6	+ 2 31.1	-1.1566	0.5651	-0.0136	-56	-90
B. A. C. 6201	7.3	2.48	11.1	18 39.2	16 31.5	+10 2.0	+0.3955	0.5630	-0.0003	+39	-12
Y Sagittarii	Var.	2.49	11.1	18 54.0	17 43.5	+11 11.5	+0.6611	0.5626	+0.0018	+63	+ 4
B. A. C. 6267	6.7	2.50	11.9	17 51.3	20 43.2	- 9 54.9	-0.4470	0.5617	0.0068	- 9	-64
B. A. C. 6287	6.0	2.53	11.7	18 47.2	21 43.5	- 8 56.6	+0.5610	0.5614	0.0085	+53	- 1
B. A. C. 6294	5.2	+2.53	+11.9	-18 27.9	22 17.9	- 8 23.4	+0.2212	0.5613	+0.0095	+29	-21
$\rho$ Sagittarii	3.9	2.73	14.8	18 1.5	17 21 29.3	- 9 58.4	+0.4091	0.5539	0.0471	+45	-11
$\rho$ Sagittarii	6.1	2.74	14.6	18 29.0	21 33.4	- 9 54.5	+0.9110	0.5539	0.0472	+72	+22
B. A. C. 6658	7.0	2.76	15.0	18 33.0	18 0 29.3	- 7 4.4	+1.1298	0.5529	0.0517	+71	+39
B. A. C. 6710	6.0	2.79	15.4	18 26.4	4 43.0	- 2 59.0	+1.2452	0.5514	0.0581	+72	+56
$\epsilon$ Sagittarii	5.6	+2.78	+16.2	-16 30.6	6 28.9	- 1 16.6	-0.7561	0.5509	+0.0607	-20	-90
$\epsilon$ Sagittarii	5.0	2.78	16.4	16 20.7	7 20.2	- 0 27.0	-0.8834	0.5506	0.0620	-29	-90
$\delta$ Sagittarii	5.0	2.83	17.2	15 44.5	14 42.1	+ 6 40.6	-1.0491	0.5481	0.0727	-41	-90
B. A. C. 6992	6.2	2.89	18.2	15 5.0	1 43.3	- 6 39.1	-0.8896	0.5443	0.0878	-27	-90
$\beta$ Capricorni	3.4	2.90	18.4	15 4.8	1 50.1	- 6 32.6	-0.8832	0.5443	0.0879	-27	-90
Lalande 39247	7.4	+2.91	+18.5	-15 17.3	4 17.9	- 4 9.4	-0.4339	0.5435	+0.0912	+ 1	-63
$\tau$ Capricorni	7.0	2.95	18.8	15 28.5	9 48.9	+ 1 11.2	+0.2936	0.5417	0.0982	+42	-18
$\tau$ Capricorni	5.3	2.95	19.0	15 17.2	10 45.7	+ 2 6.2	+0.1801	0.5414	0.0994	+36	-24
W. B. xx, 1293	6.0	3.00	19.7	14 50.9	20 23.1	+11 25.8	+0.7104	0.5382	0.1108	+75	+ 7
8 Aquarii	6.8	2.99	20.1	13 25.4	21 0.5	-11 58.0	-0.7873	0.5380	0.1116	-18	-90
9 Aquarii	7.0	+3.00	+20.0	-13 54.0	21 36.6	-11 23.0	-0.2001	0.5378	+0.1122	+16	-46
18 Aquarii	5.4	3.05	20.7	13 17.1	20 9 11.3	- 0 9.6	+0.4926	0.5344	0.1247	+59	- 6
W. B. xxi, 749	6.3	3.07	21.5	11 0.2	16 58.7	+ 7 23.7	-1.0332	0.5322	0.1323	-32	-90
$\lambda$ Capricorni	5.4	3.08	21.5	11 48.2	20 34.7	+10 53.3	+0.3356	0.5316	0.1356	+50	-15
B. A. C. 7620	6.5	3.09	21.8	10 45.5	21 0 12.9	- 9 35.0	-0.3243	0.5304	0.1388	+12	-54
B. A. C. 7697	6.8	+3.11	+21.9	-10 54.6	7 16.8	- 2 43.6	+0.8451	0.5286	+0.1446	+79	+14
B. A. C. 7774	6.2	3.12	22.4	9 30.8	12 15.7	+ 2 6.4	+0.0246	0.5276	0.1484	+32	-33
$\rho$ Aquarii	5.4	3.13	22.4	8 17.8	13 59.8	+ 3 47.5	-1.0665	0.5272	0.1496	-32	-90
67 Aquarii	6.2	3.16	22.5	7 27.6	22 2 2.8	- 8 30.6	-0.1460	0.5251	0.1574	+24	-43
B. A. C. 8017	6.1	3.18	22.5	5 13.3	11 41.4	+ 0 51.2	-1.0885	0.5237	0.1625	-33	-90
B. A. C. 8094	5.6	+3.20	+22.4	- 4 0.8	19 7.4	+ 8 4.4	-1.2113	0.5230	+0.1658	-45	-90



## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag	Red'ns from 1904.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	I'	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	"	°	d h m	h m				°	°
20 Piscium	5.7	+3.23	+21.6	- 3 17.3	23 12 18.2	+ 0 45.7	+0.8807	0.5220	+0.1709	+87	+16
W. B. xxiii, 1069	6.9	3.25	21.4	- 0 48.5	18 36.1	+ 6 52.8	-0.7934	0.5219	0.1720	-10	-90
B. A. C. 57	7.0	3.27	20.7	+ 1 9.6	24 4 10.2	- 7 49.6	-1.3270	0.5217	0.1728	-63	-89
44 Piscium	5.8	3.27	20.3	1 24.8	8 12.6	- 3 54.2	-0.9092	0.5225	0.1727	-18	-89
B. A. C. 167	7.5	3.32	19.9	2 36.2	15 28.7	+ 3 9.4	-0.9724	0.5231	0.1722	-22	-87
B. A. C. 237	6.7	+3.28	+19.0	+ 2 52.2	21 54.1	+ 9 23.7	-0.1630	0.5239	+0.1713	+25	-43
B. A. C. 243	7.3	3.29	18.9	3 34.3	22 58.1	+10 25.9	-0.7564	0.5241	0.1711	- 8	-79
77 Piscium	6.1	3.29	18.1	4 24.1	25 5 31.6	- 7 11.9	-0.5571	0.5251	0.1696	+ 3	-71
c Piscium	5.7	3.29	17.8	5 8.8	6 52.5	- 5 53.6	-1.1513	0.5253	0.1692	-37	-85
96 Piscium	6.6	3.30	16.5	6 48.2	17 38.6	+ 4 33.7	-1.1736	0.5272	0.1654	-39	-83
$\mu$ Piscium	5.2	+3.30	+16.6	+ 5 39.2	18 13.4	+ 5 7.5	+0.1893	0.5275	+0.1652	+45	-22
64 Ceti	5.7	3.27	13.4	8 7.4	26 15 22.2	+ 1 38.8	+0.8497	0.5331	0.1536	+90	+16
65 Ceti	4.5	3.26	13.3	8 24.0	16 11.8	+ 2 26.8	+0.6734	0.5333	0.1530	+85	+ 6
$\xi$ Arietis	5.4	3.27	12.1	10 10.8	22 8.7	+ 8 13.0	-0.3785	0.5353	0.1487	+13	-54
B. A. C. 755	7.0	3.27	12.0	10 8.2	23 7.4	+ 9 9.8	-0.1868	0.5356	0.1480	+24	-42
25 Arietis	7.3	+3.24	+11.9	+ 9 46.5	23 27.6	+ 9 29.5	+0.2584	0.5357	+0.1477	+49	-17
38 Arietis	5.2	3.27	10.2	12 2.7	27 8 10.9	- 6 3.3	-0.9636	0.5387	0.1405	-22	-78
W. B. ii, 1033	5.9	3.23	8.4	12 49.2	18 43.9	+ 4 10.1	-0.3745	0.5427	0.1305	+13	-51
B. A. C. 987	6.3	3.22	8.3	12 41.2	21 9.5	+ 6 31.2	+0.0839	0.5437	0.1277	+39	-24
W. B. iii, 275	6.2	3.16	7.1	12 17.5	28 3 21.9	-11 28.2	+1.2849	0.5461	0.1213	+90	+64
48 Tauri	6.4	+3.04	+ 2.2	+15 9.7	29 3 42.7	-11 55.0	+0.7704	0.5564	+0.0907	+90	+19
$\gamma$ Tauri	3.9	3.02	1.7	15 23.8	5 34.2	-10 7.2	+0.6843	0.5573	0.0881	+89	+14
55 Tauri	7.3	3.04	1.5	16 17.5	5 36.6	-10 4.9	-0.2727	0.5573	0.0880	+19	-40
$\delta$ Tauri	4.0	3.05	1.0	17 19.1	6 59.3	- 8 45.0	-1.2533	0.5578	0.0860	-56	-73
63 Tauri	5.6	3.03	1.1	16 33.2	7 13.4	- 8 31.3	-0.4133	0.5580	0.0857	+11	-49
$\theta$ Tauri	4.7	+3.04	+ 0.9	+17 13.3	7 31.5	- 8 13.8	-1.1042	0.5581	+0.0855	-36	-73
70 Tauri	6.3	3.00	1.2	15 43.3	8 15.1	- 7 31.6	+0.5653	0.5584	0.0843	+74	+ 8
71 Tauri	6.0	2.99	1.2	15 24.0	8 35.4	- 7 12.0	+0.9382	0.5586	0.0837	+90	+31
75 Tauri	5.3	3.00	0.9	16 8.7	9 32.7	- 6 16.6	+0.2192	0.5590	0.0824	+47	-12
$\eta$ Tauri	3.9	2.99	1.0	15 45.0	9 36.5	- 6 12.9	+0.6486	0.5590	0.0822	+84	+13
$\theta$ Tauri	3.6	+2.99	+ 1.0	+15 39.5	9 39.1	- 6 10.3	+0.7491	0.5590	+0.0822	+90	+19
80 Tauri	5.6	2.98	1.0	15 25.7	10 20.1	- 5 30.8	+1.0514	0.5594	0.0812	+90	+40
B. A. C. 1391	5.0	2.99	0.7	15 59.1	10 31.0	- 5 20.3	+0.4695	0.5594	0.0809	+65	+ 2
81 Tauri	5.5	2.98	0.9	15 29.0	10 33.9	- 5 17.4	+1.0113	0.5594	0.0809	+90	+37
B. A. C. 1394	7.5	2.98	0.7	15 56.5	10 37.0	- 5 14.5	+0.5251	0.5595	0.0808	+71	+ 6
85 Tauri	6.5	+2.97	+ 0.7	+15 38.8	11 7.2	- 4 45.3	+0.8817	0.5597	+0.0800	+90	+28
B. A. C. 1406	7.5	2.97	0.5	16 7.3	11 55.6	- 3 58.5	+0.4370	0.5600	0.0789	+63	+ 1
$\alpha$ Tauri	1.0	2.97	0.1	16 19.0	12 58.0	- 2 58.2	+0.3087	0.5604	0.0773	+54	- 6
89 Tauri	6.5	2.95	0.2	15 50.5	13 59.6	- 1 58.7	+0.8954	0.5609	0.0757	+90	+29
$\sigma$ Tauri	4.8	2.94	+ 0.1	15 43.7	14 30.3	- 1 29.0	+1.0549	0.5611	0.0750	+90	+41
B. A. C. 1526	5.8	+2.88	- 1.6	+17 0.2	22 40.9	+ 6 24.9	+0.2543	0.5646	+0.0623	+50	- 7
104 Tauri	5.1	2.89	2.8	18 30.9	30 3 8.8	+10 43.6	-1.0921	0.5664	0.0551	-36	-71
111 Tauri	5.2	2.75	3.7	17 17.6	10 43.5	- 5 57.5	+0.5744	0.5695	0.0424	+76	+13
115 Tauri	5.4	2.74	4.1	17 52.7	11 56.3	- 4 47.2	+0.0049	0.5700	0.0403	+34	-19
117 Tauri	6.3	2.72	3.9	17 9.5	12 19.8	- 4 24.5	+0.7830	0.5702	0.0397	+90	+25
W. B. (2) v, 606	7.0	+2.74	- 4.4	+18 17.2	12 52.9	- 3 52.6	-0.3886	0.5703	+0.0337	+12	-43
119 Tauri	4.6	2.73	4.7	18 31.3	14 9.0	- 2 39.1	-0.5890	0.5708	0.0365	0	-58
120 Tauri	5.3	2.72	4.7	18 28.3	14 43.7	- 2 5.7	-0.5142	0.5711	0.0355	+ 5	-51
122 Tauri	5.4	2.68	4.5	16 58.8	16 18.4	- 0 34.3	+1.1134	0.5718	0.0328	+90	+50
B. A. C. 1796	7.5	2.68	5.5	18 56.3	18 38.7	+ 1 41.0	-0.8803	0.5725	0.0287	-18	-71
127 Tauri	6.3	+2.68	- 5.5	+18 55.9	18 49.6	+ 1 51.5	-0.8681	0.5725	+0.0283	-17	-71
130 Tauri	5.5	+2.63	- 5.4	+17 41.5	20 49.9	+ 3 47.5	+0.4916	0.5726	+0.0248	+68	+10

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Parallels	
Name.	Mag.	Red'ns from 1904.0. $\Delta\alpha$	$\Delta\delta$	Apparent Declination.	Washington Mean Time.	Hour Angle, $H$	$y$	$x'$	$y'$	N.	S.		
		$s$	"	$^{\circ}$	d h m	h m				$^{\circ}$	$^{\circ}$		
71 Orionis	5.1	+2.49	-7.7	+19 11.2	1 8 40.5	-8 47.3	-0.9081	0.5775	+0.0034	-20	-71		
W.B.(2), vi, 286	6.5	2.44	7.3	17 21.7	10 30.0	-7 1.8	+1.0040	0.5780	0.0000	+90	+44		
20 Geminorum	6.3	2.37	8.2	17 50.7	16 9.8	-1 34.2	+0.4671	0.5797	-0.0105	+65	+10		
21 Geminorum	6.5	2.37	8.2	17 51.0	16 10.2	-1 33.8	+0.4618	0.5797	0.0105	+65	+10		
26 Geminorum	5.1	2.31	8.7	17 44.2	20 28.1	+2 34.6	+0.5158	0.5810	0.0186	+70	+12		
W.B.(2), vi, 1630	6.2	+2.18	-9.7	+17 53.4	2 4 56.3	+10 44.1	+0.1317	0.5832	-0.0345	+42	-12		
2 Geminorum	3.6	2.07	10.0	16 42.7	11 33.1	-6 53.7	+1.0755	0.5847	0.0471	+90	+46		
B. A. C. 2432	7.0	2.07	10.8	18 27.3	13 36.9	-4 54.4	-0.8204	0.5850	0.0509	-14	-72		
W.B.(2), vii, 685	5.6	1.94	10.7	17 17.3	17 17.0	-1 22.5	+0.1801	0.5856	0.0578	+45	-11		
f Geminorum	5.2	1.95	11.2	17 53.4	20 28.9	+1 42.2	-0.6317	0.5863	0.0637	-2	-64		
1 Cancri	5.9	+1.82	-11.1	+16 2.6	3 3 48.7	+8 45.6	+0.7390	0.5873	-0.0772	+90	+19		
B. A. C. 2649	6.3	1.82	11.4	16 46.5	4 26.3	+9 21.8	-0.0549	0.5874	0.0784	+31	-26		
3 Cancri	6.0	1.81	11.7	17 34.1	5 22.2	+10 15.7	-0.9384	0.5875	0.0801	-22	-72		
5 Cancri	6.4	1.80	11.5	16 43.0	5 40.8	+10 33.5	-0.0953	0.5876	0.0806	-29	-28		
29 Cancri	5.9	1.64	11.3	14 31.5	16 58.2	-2 34.4	+1.1022	0.5887	0.1007	+90	+43		
$\xi$ Leonis	5.2	+1.28	-11.1	+11 43.3	4 19 14.0	-1 17.8	+0.6957	0.5895	-0.1424	+90	+10		
A Leonis	4.6	1.11	10.5	10 27.9	5 10 9.0	-10 56.3	-0.3282	0.5892	0.1618	+15	-50		
B. A. C. 3538	7.0	1.06	10.0	9 26.7	16 6.4	-5 12.3	-0.3007	0.5891	0.1684	+17	-49		
44 Leonis	6.2	1.05	9.9	9 16.2	17 21.6	-3 59.9	-0.3387	0.5890	0.1697	+16	-52		
48 Leonis	5.2	1.02	9.3	7 26.7	21 20.6	-0 9.9	+0.7817	0.5889	0.1737	+90	+12		
37 Sextantis	6.2	+0.99	-9.0	+6 52.6	6 2 2.3	+4 21.2	+0.5166	0.5887	-0.1780	+68	-4		
56 Leonis	6.6	0.96	-8.8	+6 41.7	6 10.4	+8 20.0	-0.0480	0.5886	0.1813	+31	-35		
NEW MOON.													
$\xi^1$ Libræ	5.9	1.10	+1.9	-11 30.4	10 9 30.7	+7 58.6	-0.2737	0.5879	0.1486	+15	-50		
$\xi^2$ Libræ	5.8	+1.11	+2.1	-11 1.3	10 30.6	+8 56.2	-0.9072	0.5878	-0.1473	-23	-90		
17 Libræ	7.2	1.10	2.2	10 46.1	11 8.3	+9 32.5	-1.2536	0.5878	0.1464	-55	-90		
18 Libræ	6.2	1.10	2.2	10 45.5	11 24.2	+9 47.9	-1.3032	0.5878	0.1460	-66	-90		
$\gamma$ Libræ	4.0	1.27	3.5	14 28.1	11 2 37.5	+0 27.1	+0.3737	0.5868	0.1236	+49	-13		
B. A. C. 5188	6.6	1.30	3.6	14 44.1	5 55.2	+3 37.5	+0.2449	0.5865	0.1183	+41	-20		
$\eta$ Libræ	5.5	+1.30	+3.7	-15 22.0	6 11.1	+3 52.8	+0.8544	0.5865	-0.1179	+75	+15		
48 Libræ	4.8	1.32	4.8	14 0.1	12 6.5	+9 35.1	-1.2029	0.5858	0.1081	-53	-90		
49 Libræ	5.6	1.33	4.1	16 15.0	13 0.0	+10 26.6	-0.9006	0.5857	0.1067	+74	+25		
$\phi$ Ophiuchi	4.4	1.48	6.0	16 24.1	12 1 55.0	-1 7.0	-0.0846	0.5835	0.0846	+18	-39		
24 Scorpæ	5.2	1.54	6.2	17 33.3	6 18.1	+3 6.5	+0.7493	0.5826	0.0765	+72	+9		
B. A. C. 5695	6.2	+1.58	+7.3	-16 39.1	12 26.2	+9 1.2	-0.6178	0.5813	-0.0654	-13	-80		
B. A. C. 5771	6.2	1.65	7.7	17 28.8	17 37.5	-9 58.9	-0.0756	0.5800	0.0560	+16	-39		
B. A. C. 5839	6.0	1.70	8.2	17 39.2	22 36.0	-5 11.2	-0.1509	0.5786	0.0469	+11	-43		
B. A. C. 6060	6.5	1.87	9.8	18 47.0	13 14 8.3	+9 47.7	+0.5257	0.5736	0.0185	+51	-4		
B. A. C. 6086	6.1	1.87	10.6	17 9.0	16 33.3	-11 52.5	-1.2336	0.5727	0.0141	-66	-90		
B. A. C. 6201	7.3	+1.96	+10.9	-18 39.2	14 0 8.4	-4 33.5	+0.2974	0.5699	-0.0005	+33	-17		
Y Sagittarii	Var.	1.98	11.0	18 54.0	1 18.6	-3 25.8	+0.5595	0.5695	+0.0315	+52	-2		
B. A. C. 6267	6.7	1.99	11.7	17 51.3	4 14.1	-0 36.4	-0.5363	0.5683	0.0068	-14	-72		
B. A. C. 6287	6.0	2.02	11.5	18 47.2	5 13.0	+0 20.5	+0.4599	0.5680	0.0086	+45	8		
B. A. C. 6294	5.2	2.02	11.6	18 27.9	5 46.5	+0 52.8	+0.1233	0.5676	0.0094	+23	-27		
$\rho^1$ Sagittarii	3.9	+2.23	+14.1	-18 1.5	15 4 30.0	-1 10.2	+0.3068	0.5580	+0.0474	+38	-17		
$\rho^2$ Sagittarii	6.1	2.24	13.9	18 29.0	4 34.0	-1 6.4	+0.8037	0.5580	0.0475	+72	+14		
B. A. C. 6658	7.0	2.20	14.2	18 33.0	7 26.9	+1 40.8	+1.0201	0.5567	0.0521	+71	+29		
B. A. C. 6710	6.0	2.30	14.5	18 26.4	11 36.6	+5 42.2	+1.1356	0.5549	0.0585	+72	+40		
$\sigma^1$ Sagittarii	5.6	2.30	15.3	16 30.6	13 21.1	+7 23.2	-0.8489	0.5541	0.0612	-27	-90		
$\sigma^2$ Sagittarii	5.0	+2.30	+15.5	-16 20.7	14 11.5	+8 12.0	-0.9754	0.5537	+0.0624	-36	-90		
$\zeta$ Sagittarii	5.0	2.35	16.3	15 44.5	21 27.7	-8 46.1	-1.1404	0.5507	0.0731	-49	-90		
B. A. C. 6992	6.2	2.44	17.2	15 5.0	16 8 21.7	+1 46.8	-0.9820	0.5458	0.0882	-34	90		
$\beta$ Capricorni	3.4	2.45	17.3	15 4.8	8 28.4	+1 53.3	-0.9755	0.5457	0.0884	-33	-90		
Lalande 39247	7.4	2.48	17.4	15 17.3	10 54.8	+4 15.0	-0.5290	0.5447	0.0916	-5	-71		
$\tau^1$ Capricorni	7.0	+2.53	+17.6	-15 28.5	16 23.1	+9 32.8	+0.1951	0.5425	+0.0986	+36	-23		

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1904.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	$\gamma$	$\alpha'$	$\gamma'$	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
$\tau^2$ Capricorni	5.3	+2.53	+17.7	-15 17.2	16 17 19.6	+10 27.6	+0.0825	0.5420	+0.0998	+30	-29
W. B. xx, 1293	6.0	2.60	18.4	14 51.0	17 2 53.4	- 4 16.4	+0.6126	0.5383	0.1112	+67	0
8 Aquarii	6.8	2.60	18.9	13 25.8	3 30.7	- 3 40.3	-0.8779	0.5380	0.1119	-24	-90
9 Aquarii	7.0	2.61	18.8	13 54.0	4 6.6	- 3 5.5	-0.2933	0.5378	0.1126	+11	-52
18 Aquarii	5.4	2.70	19.5	13 17.1	15 38.9	+ 8 5.6	+0.4008	0.5337	0.1250	+53	-12
W. B. xxi, 749	6.3	+2.74	+20.4	-11 0.2	23 25.3	- 8 22.1	-1.1174	0.5311	+0.1325	-39	-90
$\lambda$ Capricorni	5.4	2.77	20.2	11 48.2	18 3 1.3	- 4 52.6	+0.2498	0.5301	0.1358	+44	-20
B. A. C. 7620	6.5	2.79	20.6	10 45.5	6 39.3	- 1 21.1	-0.4067	0.5290	0.1389	+ 8	-60
B. A. C. 7697	6.8	2.84	20.6	10 54.6	13 43.2	+ 5 30.3	+0.7637	0.5272	0.1448	+79	+ 9
$\rho$ Aquarii	5.4	2.88	21.4	8 17.9	20 26.4	-11 58.4	-1.1398	0.5256	0.1498	-39	-90
67 Aquarii	6.2	+2.96	+21.5	- 7 27.7	19 8 30.4	- 0 15.5	-0.2126	0.5233	+0.1577	+20	-47
$\gamma$ Aquarii	3.8	2.98	21.3	8 5.1	13 26.5	+ 4 32.0	+1.2664	0.5227	0.1605	+82	+51
B. A. C. 8017	6.1	3.03	21.8	5 13.4	18 9.9	+ 9 7.3	-1.1461	0.5221	0.1629	-38	-90
B. A. C. 8094	5.6	3.08	21.9	4 0.8	20 1 36.5	- 7 39.0	-1.2623	0.5214	0.1662	-51	-90
20 Piscium	5.7	3.18	21.2	3 17.3	18 48.1	+ 9 3.0	+0.8425	0.5210	0.1716	+87	+13
W. B. xxiii, 1069	6.9	+3.23	+21.3	- 0 48.5	21 1 5.9	- 8 50.0	-0.8224	0.5212	+0.1728	-12	-90
44 Piscium	5.8	3.32	20.5	+ 1 24.8	14 41.5	+ 4 22.2	-0.9227	0.5225	0.1738	-19	-89
B. A. C. 167	7.5	3.40	20.3	2 36.2	21 56.6	+11 24.7	-0.9774	0.5235	0.1735	-22	-87
B. A. C. 237	6.7	3.39	19.4	2 52.2	22 4 20.6	- 6 22.3	-0.1625	0.5246	0.1727	+25	-43
B. A. C. 243	7.3	3.41	19.4	3 34.3	5 24.3	- 5 20.4	-0.7534	0.5248	0.1725	- 8	-80
77 Piscium	6.1	+3.44	+18.6	+ 4 24.1	11 56.1	+ 1 0.0	-0.5466	0.5250	+0.1711	+ 4	-70
$\epsilon$ Piscium	5.7	3.44	18.5	5 8.8	13 16.6	+ 2 18.1	-1.1376	0.5265	0.1708	-35	-85
96 Piscium	6.6	3.52	17.4	6 48.2	23 59.1	-11 18.2	-1.1467	0.5292	0.1672	-36	-83
$\mu$ Piscium	5.2	3.51	17.3	5 39.2	23 0 33.7	-10 44.7	+0.2131	0.5294	0.1670	+47	-20
64 Ceti	5.7	3.58	14.3	8 7.5	21 33.0	+ 9 37.0	+0.8972	0.5359	0.1565	+90	+20
65 Ceti	4.5	+3.59	+14.2	+ 8 24.0	22 22.1	+10 24.5	+0.7223	0.5362	+0.1551	+90	+ 9
$\xi$ Arietis	5.4	3.64	13.3	10 10.8	24 4 15.8	- 7 52.5	-0.3191	0.5383	0.1508	+17	-50
B. A. C. 755	7.0	3.64	13.1	10 8.2	5 13.9	- 6 56.2	-0.1270	0.5387	0.1501	+27	-38
25 Arietis	7.3	3.62	12.9	9 46.5	5 34.0	- 6 36.7	+0.3192	0.5388	0.1498	+54	14
38 Arietis	5.2	3.69	11.5	12 2.1	14 12.5	+ 1 45.8	-0.8903	0.5421	0.1426	-17	-78
W. B. ii, 1033	5.9	+3.69	+ 9.6	+12 49.2	25 0 39.4	+11 52.9	-0.2918	0.5463	+0.1326	+18	46
B. A. C. 987	6.3	3.69	9.4	12 41.2	3 3.6	- 9 47.5	+0.1688	0.5469	0.1300	+44	-19
W. B. (2), iv, 59	6.4	3.71	2.9	17 1.9	28 7 49.4	- 5 57.8	-1.2612	0.5590	0.0944	-57	-73
48 Tauri	6.4	3.65	3.0	15 9.7	9 21.0	- 4 29.3	+0.8882	0.5595	0.0922	+90	+27
$\gamma$ Tauri	3.9	3.65	2.5	15 23.8	11 11.7	- 2 42.3	+0.8031	0.5603	0.0896	+90	+22
55 Tauri	7.3	+3.68	+ 2.3	+16 17.5	11 14.1	- 2 40.0	-0.1532	0.5603	+0.0895	+26	-33
$\delta$ Tauri	4.0	3.70	1.9	17 19.1	12 36.2	- 1 20.6	-1.1319	0.5608	0.0875	-38	-73
63 Tauri	5.6	3.67	1.9	16 33.2	12 50.3	- 1 7.0	-0.2921	0.5609	0.0872	-18	-41
$\delta^2$ Tauri	4.7	3.69	1.8	17 13.3	13 8.2	- 0 49.6	-0.9825	0.5610	0.0868	-26	-73
70 Tauri	6.3	3.65	1.9	15 43.3	13 51.6	- 0 7.7	+0.6869	0.5613	0.0857	-90	+15
71 Tauri	6.0	+3.64	+ 1.9	+15 24.1	14 11.7	+ 0 11.8	+1.0599	0.5614	+0.0852	-60	+40
75 Tauri	5.3	3.64	1.6	16 8.7	15 8.7	+ 1 6.8	+0.3421	0.5617	0.0838	-56	- 5
$\theta^1$ Tauri	3.9	3.64	1.7	15 45.0	15 12.5	+ 1 10.5	+0.7716	0.5618	0.0837	+90	+20
$\theta^2$ Tauri	3.6	3.64	1.7	15 39.6	15 15.0	+ 1 12.9	+0.8719	0.5618	0.0836	+90	+27
80 Tauri	5.6	3.63	1.6	15 25.7	15 55.7	+ 1 52.2	+1.1746	0.5621	0.0826	+90	+52
B. A. C. 1391	5.0	+3.64	+ 1.4	+15 59.1	16 6.6	+ 2 2.8	+0.5934	0.5621	+0.0823	+77	+10
81 Tauri	5.5	3.64	1.5	15 29.0	16 9.5	+ 2 5.6	+1.1349	0.5621	0.0823	+90	+48
B. A. C. 1394	7.5	3.63	1.4	15 56.0	16 12.6	+ 2 8.6	+0.6489	0.5621	0.0822	+84	+13
85 Tauri	6.5	3.63	1.4	15 38.8	16 42.6	+ 2 37.6	+1.0059	0.5624	0.0815	+90	+36
B. A. C. 1406	7.5	3.63	1.1	16 7.3	17 30.8	+ 3 24.1	+0.5622	0.5627	0.0802	+74	+ 8
$\alpha$ Tauri	1.0	+3.63	+ 0.7	+16 19.0	18 32.7	+ 4 23.9	+0.4348	0.5631	+0.0787	+63	+ 1
89 Tauri	6.5	3.61	0.7	15 50.5	19 34.1	+ 5 23.2	+1.0226	0.5635	0.0771	+90	+38
$\sigma^2$ Tauri	4.8	3.61	+ 0.7	15 43.7	20 4.6	+ 5 52.7	+1.1825	0.5663	0.0763	+90	+53
B. A. C. 1526	5.8	3.58	- 1.3	17 0.2	27 4 13.2	-10 15.5	+0.3891	0.5666	0.0634	+59	0
104 Tauri	5.1	3.62	2.5	18 30.9	8 40.3	- 5 57.6	-0.9556	0.5681	0.0561	23	-71
111 Tauri	5.2	+3.51	- 3.7	+17 17.6	16 14.6	+ 1 20.9	+0.7198	0.5703	+0.0433	+90	+21

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

## OCTOBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1904.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	<i>N</i>	<i>S</i>
		$\Delta\alpha$	$\Delta\delta$		d h m	h m				°	°
115 Tauri	5.4	+3.50	-4.1	+17 52.7	27 17 27.5	+2 31.9	+0.1500	0.5709	+0.0412	+43	-12
117 Tauri	6.3	3.48	4.0	17 9.5	17 50.8	+2 53.8	+0.9302	0.5710	0.0405	+90	+35
W.B.(2), v, 606	7.0	3.50	4.4	18 17.2	18 24.0	+3 25.8	-0.2441	0.5711	0.0396	+20	-33
119 Tauri	4.6	3.49	4.7	18 31.3	19 40.2	+4 39.4	-0.4442	0.5715	0.0372	+9	-46
120 Tauri	5.3	3.48	4.8	18 28.3	20 14.9	+5 12.8	-0.3688	0.5717	0.0364	+13	-41
122 Tauri	5.4	+3.44	-4.7	+16 58.8	21 49.6	+6 44.2	+1.2651	0.5722	+0.0336	+90	+70
B. A. C. 1796	7.5	3.46	5.7	18 56.3	28 0 10.3	+8 59.8	-0.7339	0.5728	0.0295	-7	-71
127 Tauri	6.3	3.46	5.7	18 55.9	0 21.1	+9 10.3	-0.7216	0.5729	0.0291	-7	-71
130 Tauri	5.5	3.41	5.7	17 41.5	2 21.8	+11 6.7	+0.6442	0.5734	0.0256	+84	+19
71 Orionis	5.1	3.30	8.5	19 11.2	14 16.0	-1 24.5	-0.7551	0.5761	0.0040	-10	-70
W. B. (2), vi, 286	6.5	+3.25	-8.2	+17 21.6	16 6.3	+0 21.9	+1.1691	0.5765	+0.0006	+90	+58
20 Geminorum	6.3	3.19	9.3	17 50.7	21 49.2	+5 52.5	+0.6322	0.5775	-0.0099	+83	+21
21 Geminorum	6.5	3.19	9.3	17 51.0	21 49.5	+5 52.7	+0.6268	0.5775	0.0099	+82	+19
22 Geminorum	7.2	3.21	10.0	19 30.0	22 48.4	+6 49.6	-1.1145	0.5779	0.0121	-38	-70
26 Geminorum	5.1	3.13	10.0	17 44.2	29 2 10.2	+10 4.1	+0.6835	0.5782	0.0180	+90	+22
W.B.(2), vi, 1630	6.2	+3.01	-11.3	+17 53.3	10 44.9	-5 39.8	+0.2999	0.5798	-0.0339	+53	-2
2 Geminorum	3.6	2.90	11.9	16 42.6	17 28.1	+0 48.8	+1.2549	0.5799	0.0463	+90	+67
B. A. C. 2432	7.0	2.90	12.7	18 27.3	19 34.0	+2 50.1	-0.6594	0.5800	0.0502	-3	-65
W.B.(2), vii, 685	5.6	2.83	12.8	17 17.2	23 18.3	+6 26.3	+0.3520	0.5802	0.0571	+57	-1
f Geminorum	5.2	2.78	13.4	17 53.4	30 2 34.0	+9 34.7	-0.4682	0.5803	0.0630	+8	-50
1 Cancr	5.9	+2.65	-13.7	+16 2.6	10 3.4	-7 12.2	+0.9191	0.5805	-0.0763	+90	+31
B. A. C. 2649	6.3	2.65	14.0	16 46.4	10 41.9	-6 35.1	+0.1155	0.5805	0.0775	+41	-17
3 Cancr	6.0	2.64	14.3	17 34.1	11 39.1	-5 40.0	-0.7789	0.5805	0.0791	-11	-72
5 Cancr	6.4	2.63	14.1	16 43.0	11 58.1	-5 21.8	+0.0747	0.5805	0.0797	+39	-19
29 Cancr	5.9	+2.43	-14.3	+14 31.5	23 33.1	+5 48.0	+1.2873	0.5803	-0.0995	+90	+70

## NOVEMBER.

ξ Leonis	5.2	+2.01	-14.6	+11 43.3	1 2 38.2	+7 54.0	+0.8672	0.5789	-0.1405	+90	+21
A Leonis	4.6	1.79	14.2	10 27.9	18 4.9	-1 12.7	-0.1846	0.5779	0.1595	+24	-41
B. A. C. 3538	7.0	+1.72	-13.8	+9 26.7	2 0 15.3	+4 44.3	-0.1623	0.5776	-0.1644	+25	-40
44 Leonis	6.2	1.70	13.6	9 16.2	1 33.2	+5 59.5	-0.2023	0.5776	0.1674	+23	-43
48 Leonis	5.2	1.65	12.9	7 26.7	5 40.9	+9 58.2	+0.9327	0.5774	0.1715	+90	+21
37 Sextantis	6.2	1.60	12.6	6 52.5	10 32.9	-9 19.3	+0.6578	0.5773	0.1755	+83	+4
56 Leonis	6.6	1.54	12.4	6 41.7	14 49.9	-5 12.5	+0.0791	0.5773	0.1791	+39	-29
82 Leonis	6.9	+1.43	-10.8	+3 49.6	3 37.4	+8 7.4	+0.5999	0.5774	-0.1872	+75	-1
83 Leonis	6.1	1.38	10.5	3 32.0	4 7.7	+7 36.6	+0.7933	0.5774	0.1874	+90	+11
7 Leonis	5.1	1.42	10.6	3 22.9	4 36.3	+8 4.2	+0.8599	0.5774	0.1877	+90	+15
W. B. xi, 349	5.1	1.42	10.6	3 21.4	4 30.6	+8 4.5	+0.8845	0.5774	0.1877	+90	+16
MARS				5 12.9	6 15.7	+9 40.0	+1.2321	0.5542	0.1791	-45	-84
89 Leonis	6.2	+1.38	-10.6	+3 35.4	7 23.1	+10 44.9	+0.1280	0.5776	-0.1890	+42	-27
3 Virginis	3.7	1.37	9.8	+2 18.2	14 22.9	-6 30.3	+0.0793	0.5779	0.1915	+39	-30
13 Virginis	6.3	1.26	8.0	-0 15.4	4 2 26.7	+5 7.3	+0.2993	0.5790	0.1936	+52	-18
4 Virginis	4.1	1.25	7.9	0 8.1	2 58.7	+5 38.2	+0.0762	0.5791	0.1937	+39	-30
7 Virginis	2.8	1.16	6.8	0 55.4	12 19.4	-9 21.3	-0.9482	0.5801	0.1930	-20	-90
38 Virginis	6.2	+1.17	-5.8	-3 2.0	17 13.9	-4 37.5	+0.2027	0.5808	-0.1920	+46	-23
4 Virginis	5.9	1.19	5.5	3 17.7	19 58.9	-1 58.5	-0.0633	0.5812	0.1911	+30	-38
46 Virginis	6.1	1.16	5.5	2 51.2	20 22.9	-1 35.4	-0.5787	0.5812	0.1910	+2	-74
48 Virginis	6.6	1.15	5.4	3 8.9	21 47.6	-0 13.8	-0.5552	0.5814	0.1905	+3	-71
51 Virginis	4.4	1.17	-4.8	5 1.7	5 0 21.4	+2 14.5	+0.8253	0.5818	0.1895	+75	+12
NEW MOON.											
B. A. C. 5695	6.2	+1.35	+7.3	-16 39.1	8 22 33.2	-3 3.8	-0.7504	0.5883	-0.0677	-21	-90
B. A. C. 5771	6.2	1.39	7.8	17 28.8	9 3 38.0	+1 49.7	-0.2203	0.5873	0.0581	+9	-48
B. A. C. 5839	6.0	1.42	8.3	17 39.2	8 29.9	+6 30.8	-0.3020	0.5863	0.0489	+3	-53
B. A. C. 6060	6.5	+1.52	+9.8	-18 47.0	23 39.8	-2 52.8	+0.3473	0.5818	-0.0199	+38	-15

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Parallels.	
Name.	Mag.	Red'ns from 1904.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.		
		$\Delta\alpha$	$\Delta\delta$										
		$\alpha$	$\delta$	$\circ$	d	h	m	h	m				
B. A. C. 6201	7.3	+1.59	+10.8	-18 39.2	10	9	24.7	+ 6 30.8	+0.1090	0.5782	-0.0016	+22 -28	
Y Sagittarii	Var.	1.60	10.9	18 54.0	10	33.1	+ 7 36.7	+0.3673	0.5779	+0.0005	+37 -13		
B. A. C. 6267	6.7	1.61	11.4	17 51.4	13	24.0	+10 21.5	-0.7206	0.5766	0.0059	-25 -90		
B. A. C. 6287	6.0	1.62	11.3	18 47.2	14	21.5	+11 17.0	+0.2641	0.5762	0.0076	+31 -19		
B. A. C. 6294	5.2	1.63	11.4	18 27.9	14	54.2	+11 48.6	-0.0689	0.5759	0.0086	+12 -39		
$\rho^1$ Sagittarii	3.9	+1.79	+13.5	-18 1.5	11	13	3.3	+ 9 11.0	+0.0904	0.5654	+0.0474	+25 -29	
$\rho^2$ Sagittarii	6.1	1.81	13.3	18 29.0	13	7.2	+ 9 14.7	+0.5828	0.5653	0.0475	+58 -1		
B. A. C. 6658	7.0	1.83	13.5	18 33.0	15	56.0	+11 57.7	+0.7950	0.5639	0.0521	+71 +12		
B. A. C. 6710	6.0	1.85	13.8	18 26.4	19	59.8	- 8 6.8	+0.9055	0.5618	0.0587	+72 +19		
$\epsilon^1$ Sagittarii	5.6	1.85	14.5	16 30.6	21	41.9	- 6 28.2	-1.0603	0.5610	0.0614	-43 -90		
$\epsilon^2$ Sagittarii	5.0	+1.86	+14.6	-16 20.7	22	31.2	- 5 40.6	-1.1862	0.5604	+0.0627	-55 -90		
B. A. C. 6992	6.2	1.99	16.0	15 5.0	12	16 18.2	+11 31.0	-1.2044	0.5511	0.0888	-54 -90		
$\beta$ Capricorni	3.4	2.00	16.2	15 4.8	16	24.8	+11 37.5	-1.1979	0.5510	0.0890	-54 -90		
Lalande 39247	7.4	2.02	16.2	15 17.3	18	48.4	-10 3.6	-0.7564	0.5498	0.0922	-19 -90		
$\gamma^1$ Capricorni	7.0	2.08	16.3	15 28.5	18	0 10.8	- 4 51.7	-0.0404	0.5476	0.0993	+23 -37		
$\gamma^2$ Capricorni	5.3	+2.08	+16.4	-15 17.3	1	6.3	- 3 58.9	-0.1524	0.5465	+0.1005	+17 -44		
W. B. xx, 1293	6.0	2.16	17.0	14 51.0	10	30.9	+ 5 8.7	+0.3715	0.5418	0.1120	+49 -14		
8 Aquarii	6.8	2.16	17.5	13 25.8	11	7.6	+ 5 44.2	-1.1083	0.5415	0.1127	-41 -90		
9 Aquarii	7.0	2.16	17.3	13 54.1	11	43.0	+ 6 18.5	-0.5279	0.5412	0.1134	- 2 -70		
18 Aquarii	5.4	2.26	17.8	13 17.1	23	6.3	- 6 39.4	+0.1611	0.5361	0.1257	+37 -25		
$\lambda$ Capricorni	5.4	+2.36	+18.5	-11 48.2	14	10 21.7	+ 4 15.5	+0.0121	0.5314	+0.1365	+30 -34		
B. A. C. 7620	6.5	2.39	18.9	10 45.5	13	58.1	+ 7 45.4	-0.6394	0.5300	0.1397	- 5 -81		
B. A. C. 7697	6.8	2.45	18.8	10 54.6	20	59.2	- 9 26.0	+0.5282	0.5276	0.1455	+05 - 5		
B. A. C. 7774	6.2	2.50	19.3	9 30.8	15	1 56.7	- 4 37.5	-0.2815	0.5260	0.1492	+16 -51		
67 Aquarii	6.2	2.62	19.8	7 27.6	15	42.1	+ 8 43.8	-0.4334	0.5224	0.1583	+ 9 -61		
$\gamma$ Aquarii	3.8	+2.66	+19.3	- 8 5.1	20	37.9	-10 29.0	+1.0454	0.5214	+0.1610	+82 +28		
20 Piscium	5.7	2.93	19.6	3 17.4	17	2 1.7	- 5 55.8	+0.6566	0.5185	0.1721	+82 + 1		
W. B. xxiii, 1069	6.9	3.02	19.9	- 0 48.5	8	20.7	+ 0 12.5	-0.9974	0.5189	0.1734	-26 -90		
44 Piscium	5.8	3.16	19.4	+ 1 24.8	21	58.7	-10 32.9	-1.0771	0.5201	0.1747	-30 -89		
B. A. C. 167	7.5	3.28	19.2	2 36.2	18	5 15.1	- 3 29.1	-1.1185	0.5210	0.1743	-33 -88		
B. A. C. 237	6.7	+3.29	+18.3	+ 2 52.2	11	40.1	+ 2 44.8	-0.2942	0.5226	+0.1738	+18 -52		
B. A. C. 243	7.3	3.31	18.4	3 34.3	12	43.9	+ 3 46.8	-0.8822	0.5228	0.1737	-16 -86		
77 Piscium	6.1	3.38	17.8	4 24.1	19	16.5	+10 8.0	-0.6635	0.5244	0.1724	- 2 -82		
$\epsilon$ Piscium	5.7	3.38	17.8	5 8.8	20	37.2	+11 26.3	-1.2503	0.5247	0.1720	-49 -85		
96 Piscium	6.6	3.51	16.8	6 48.2	19	7 20.1	- 2 9.6	-1.2382	0.5280	0.1688	-46 -83		
$\mu$ Piscium	5.2	+3.50	+16.5	+ 5 39.2	7	54.7	- 1 36.0	+0.1195	0.5282	+0.1686	+41 -27		
64 Ceti	5.7	3.68	13.8	8 7.5	20	4 51.4	- 5 17.0	+0.8440	0.5362	0.1578	+90 +16		
65 Ceti	4.5	3.69	13.8	8 24.0	5	40.5	- 4 29.5	+0.6719	0.5365	0.1573	+85 + 5		
$\xi$ Arietis	5.4	3.78	13.1	10 10.8	11	32.5	+ 1 11.8	-0.3532	0.5391	0.1531	+15 -52		
B. A. C. 755	7.0	3.78	12.9	10 8.2	12	30.4	+ 2 7.9	-0.1595	0.5395	0.1524	+44 -40		
25 Arietis	7.3	+3.76	+12.6	+ 9 46.5	12	50.4	+ 2 27.3	+0.2840	0.5396	+0.1522	+51 -16		
38 Arietis	5.2	3.88	11.5	12 2.7	21	25.5	+10 46.3	-0.9000	0.5436	0.1452	-17 -78		
W. B. ii, 1033	5.9	3.94	9.6	12 49.2	21	7 47.1	- 3 11.7	-0.2816	0.5486	0.1353	+19 -45		
B. A. C. 987	6.3	3.95	9.4	12 41.2	10	10.0	- 0 53.4	+0.1821	0.5498	0.1329	+45 -19		
W. B. (2) iv, 59	6.4	4.14	3.1	17 1.9	22	14 34.0	+ 2 34.3	-1.1782	0.5636	0.0973	-45 -73		
48 Tauri	6.4	+4.09	+ 2.8	+15 9.7	16	4.2	+ 4 1.5	+0.9607	0.5643	+0.0951	+90 +32		
$\gamma$ Tauri	3.9	4.10	2.3	15 23.8	17	53.1	+ 5 46.7	+0.8797	0.5651	0.0925	+90 +26		
55 Tauri	7.3	4.13	2.3	16 17.5	17	55.6	+ 5 49.1	-0.0700	0.5652	0.0924	+30 -28		
$\delta^1$ Tauri	4.0	4.16	2.0	17 19.1	19	16.4	+ 7 7.1	-1.0395	0.5658	0.0904	-29 -73		
63 Tauri	5.6	4.14	1.9	16 33.3	19	30.2	+ 7 20.4	-0.2049	0.5659	0.0901	+23 -36		
$\delta^2$ Tauri	4.7	+4.15	+ 1.8	+17 13.3	19	48.0	+ 7 37.7	-0.8899	0.5661	+0.0896	-18 -73		
70 Tauri	6.3	4.11	1.7	15 43.3	20	30.6	+ 8 18.8	+0.7699	0.5666	0.0886	+90 +20		
71 Tauri	6.0	4.10	1.6	15 24.1	20	50.5	+ 8 38.1	+1.1412	0.5666	0.0880	+90 +48		
75 Tauri	5.3	4.12	1.4	16 8.7	21	46.6	+ 9 32.2	+0.4301	0.5669	0.0866	+63 0		
$\theta^1$ Tauri	3.9	4.11	1.4	15 45.0	21	50.2	+ 9 35.7	+0.8566	0.5670	0.0866	+90 +26		
$\theta^2$ Tauri	3.6	+4.11	+ 1.4	+15 39.5	21	52.7	+ 9 38.2	+0.9573	0.5672	+0.0865	+90 +32		

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

## NOVEMBER.

THE STAR'S				AT CONJUNCTION IN R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1904.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	<i>Y</i>	<i>x'</i>	<i>y'</i>	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
B. A. C. 1391	5.0	+4.12	+ 1.2	+15 59.1	22 22 43.5	+10 27.2	+0.6815	0.5673	+0.0852	+89	+15
81 Tauri	5.5	4.10	1.2	15 29.0	22 46.4	+10 30.0	+1.2197	0.5673	0.0851	+90	+57
B. A. C. 1394	7.5	4.11	1.2	15 56.5	22 49.4	+10 32.9	+0.7369	0.5674	0.0851	+90	+18
85 Tauri	6.5	4.11	1.1	15 38.8	23 18.9	+11 1.3	+1.0924	0.5676	0.0843	+90	+43
B. A. C. 1406	7.5	4.12	0.9	16 7.3	23 0 6.3	+11 47.1	+0.6533	0.5679	0.0831	+85	+13
$\alpha$ Tauri	1.0	+4.12	+ 0.5	+16 19.0	1 7.3	-11 14.0	+0.5289	0.5683	+0.0815	+71	+ 6
89 Tauri	6.5	4.11	0.4	15 50.5	2 7.6	-10 15.8	+1.1146	0.5688	0.0799	+90	+47
$\sigma^2$ Tauri	4.8	4.10	+ 0.5	15 43.7	2 37.6	- 9 46.8	+1.2745	0.5690	0.0791	+90	+67
B. A. C. 1526	5.8	4.12	- 1.6	17 0.2	10 38.0	- 2 3.2	+0.5024	0.5720	0.0661	+69	+ 6
104 Tauri	5.1	4.19	2.7	18 30.9	15 0.6	+ 2 10.3	-0.8246	0.5739	0.0587	-14	-71
111 Tauri	5.2	+4.11	- 4.3	+17 17.6	22 26.8	+ 9 20.6	+0.8537	0.5765	+0.0457	+90	+29
115 Tauri	5.4	4.11	4.7	17 52.7	23 38.4	+10 29.7	+0.2897	0.5768	0.0436	+52	- 3
117 Tauri	6.3	4.09	4.7	17 9.5	24 0 1.5	+10 51.9	+1.0659	0.5769	0.0429	+90	+43
W.B.(2) v,606	7.0	4.12	4.9	18 17.2	0 34.1	+11 23.3	-0.1000	0.5771	0.0419	+29	-25
119 Tauri	4.6	4.12	5.3	18 31.3	1 48.8	-11 24.7	-0.2966	0.5775	0.0398	+17	-36
120 Tauri	5.3	+4.11	- 5.4	+18 28.2	2 23.0	-10 51.7	-0.2207	0.5776	+0.0386	+22	-31
B. A. C. 1796	7.5	4.11	6.3	18 56.3	6 14.3	- 7 8.7	-0.5765	0.5787	0.0316	+ 1	-61
127 Tauri	6.3	4.11	6.4	18 55.9	6 25.0	- 6 58.3	-0.5639	0.5788	0.0313	+ 2	-55
130 Tauri	5.5	4.06	6.7	17 41.5	8 23.6	- 5 4.0	+0.7973	0.5793	0.0277	+90	+28
$\chi^3$ Orionis	5.1	4.07	8.5	19 41.4	15 13.4	+ 1 31.0	-1.1532	0.5809	0.0153	-42	-70
71 Orionis	5.1	+4.02	- 9.6	+19 11.2	20 5.8	+ 6 12.7	-0.5744	0.5819	+0.0057	+ 2	-54
20 Geminorum	6.3	3.93	10.9	17 50.7	25 3 31.7	-10 37.7	+0.8177	0.5830	-0.0084	+90	+30
21 Geminorum	6.5	3.93	10.8	17 51.0	3 32.1	-10 37.3	+0.8123	0.5830	0.0085	+90	+30
22 Geminorum	7.2	3.95	11.4	19 30.0	4 30.1	- 9 41.8	-0.9190	0.5831	0.0103	-21	-70
26 Geminorum	5.1	3.88	11.8	17 44.2	7 48.9	- 6 29.9	+0.8756	0.5834	0.0166	+90	+34
W.B.(2) vi,1630	6.2	+3.80	-13.4	+17 53.3	16 16.9	+ 1 39.5	+0.5060	0.5839	-0.0328	+69	+10
B. A. C. 2432	7.0	3.72	15.0	18 27.2	26 0 59.8	+10 3.2	-0.4388	0.5839	0.0493	+ 9	-47
W.B.(2) vii,685	5.6	3.65	15.4	17 17.2	4 41.7	-10 23.0	+0.5751	0.5838	0.0562	+76	+12
f Geminorum	5.2	3.62	16.1	17 53.4	7 55.8	- 7 16.1	-0.2400	0.5836	0.0622	-21	-35
1 Cancri	5.9	3.49	16.7	16 2.5	15 22.1	- 0 6.1	+1.1544	0.5829	0.0756	+90	+50
B. A. C. 2649	6.3	+3.49	-17.0	+16 46.4	16 0.4	+ 0 30.8	+0.3518	0.5829	-0.0768	+57	- 3
3 Cancri	6.0	3.49	17.3	17 34.0	16 57.2	+ 1 25.5	-0.5413	0.5827	0.0784	+ 4	-57
5 Cancri	6.4	3.47	17.2	16 42.9	17 16.2	+ 1 43.8	+0.3124	0.5827	0.0790	+54	- 5
$\xi$ Leonis	5.2	2.87	19.1	11 43.2	28 8 2.1	- 8 54.7	+1.1356	0.5758	0.1396	+90	+42
A Leonis	4.6	2.64	19.1	10 27.8	23 41.8	+ 6 11.5	+0.0776	0.5727	0.1582	+39	-27
B. A. C. 3538	7.0	+2.56	-18.7	+ 9 26.6	29 5 59.1	-11 44.4	+0.0987	0.5715	-0.1647	+40	-27
44 Leonis	6.2	2.54	18.6	9 16.1	7 18.6	-10 27.8	+0.0578	0.5713	0.1660	+38	-28
48 Leonis	5.2	2.47	17.9	7 26.6	11 31.6	- 6 23.7	+1.2031	0.5705	0.1698	+90	+45
37 Sextantis	6.2	2.41	17.8	6 52.5	16 30.3	- 1 35.5	+0.9234	0.5700	0.1740	+90	+20
56 Leonis	6.6	2.35	17.5	6 41.6	20 53.7	+ 2 38.7	+0.3357	0.5694	0.1773	+55	-15
82 Leonis	6.9	+2.20	-15.7	+ 3 49.5	30 10 2.2	- 8 40.5	+0.8527	0.5683	-0.1853	+90	+14
83 Leonis	6.1	2.15	15.5	3 31.9	10 33.3	- 8 10.4	+1.0536	0.5683	0.1855	+90	+28
$\gamma$ Leonis	5.1	2.19	15.6	3 22.8	11 2.7	- 7 42.0	+1.1157	0.5682	0.1858	+90	+34
W. B. xi, 349	5.1	2.19	15.6	3 21.3	11 3.1	- 7 41.7	+1.1403	0.5682	0.1858	+90	+36
89 Leonis	6.2	2.14	15.6	3 35.3	13 54.6	- 4 56.1	+0.3705	0.5680	0.1870	+57	-14
$\beta$ Virginis	3.7	+2.11	-14.7	+ 2 18.1	21 7.4	+ 2 1.7	+0.3124	0.5680	-0.1896	+53	-17

## DECEMBER.

13 Virginis	6.3	1.95	12.6	- 0 15.4	1 9 35.1	- 9 56.6	+0.5174	0.5684	-0.1917	+68	- 6
$\eta$ Virginis	4.1	+1.94	-12.6	- 0 8.2	10 8.2	- 9 24.6	+0.2897	0.5685	-0.1917	+52	-18
MARS				1 19.9	16 0.7	- 3 44.4	+0.3692	0.5474	0.1825	+57	-13
$\gamma$ Virginis (mean)	2.8	1.82	11.3	0 55.5	19 48.2	- 0 4.8	-0.7663	0.5696	0.1912	- 8	-90
38 Virginis	6.2	1.81	10.1	3 2.1	2 0 52.7	+ 4 48.9	+0.3930	0.5699	0.1903	+58	-13
$\kappa$ Virginis	5.9	1.82	9.7	3 17.8	3 43.4	+ 7 33.7	+0.1172	0.5703	0.1895	+41	-28
46 Virginis	6.1	+1.79	- 9.8	- 2 51.3	4 8.3	+ 7 57.7	-0.4070	0.5704	-0.1894	+11	-60

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1904.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	$\gamma$	$\gamma'$	$\gamma''$	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
48 Virginis	6.6	+1.78	-9.6	-3 9.0	2 5 35.9	+9 22.2	-0.3864	0.5706	-0.1889	+13	-58
51 Virginis	4.4	1.77	8.7	5 1.8	8 15.0	+11 55.8	+1.0094	0.5709	0.1880	+85	+25
66 Virginis	5.8	1.73	8.0	4 39.9	14 39.5	-5 53.3	-0.5541	0.5722	0.1852	+3	-72
$\beta$ Virginis	6.1	1.72	7.3	5 58.6	17 13.8	-3 24.3	+0.2948	0.5727	0.1838	+51	-18
$\beta$ Virginis	4.9	1.70	7.3	5 45.7	17 54.6	-2 45.0	-0.0464	0.5729	0.1834	+30	-37
77 Virginis	7.0	+1.72	-6.9	-7 7.9	18 31.9	-2 9.0	+1.2211	0.5730	-0.1831	+83	+44
80 Virginis	5.8	1.69	7.3	4 54.6	19 27.9	-1 15.1	-1.1913	0.5732	0.1825	-42	-90
81 Virginis	7.0	1.71	6.6	7 23.0	20 21.2	-0 23.6	+1.1435	0.5733	0.1820	+83	+36
B. A. C. 4647	6.4	1.64	5.5	7 35.3	3 55.9	+6 34.9	-0.0107	0.5750	0.1768	+32	-35
94 Virginis	6.8	1.63	4.7	8 26.1	8 49.7	+11 38.3	-0.0115	0.5762	0.1728	+32	-35
95 Virginis	5.7	+1.65	-4.6	-8 51.4	9 0.7	+11 48.9	+0.3826	0.5762	-0.1727	+55	-14
96 Virginis	6.5	1.65	4.2	9 52.9	9 59.5	-11 14.4	+1.2488	0.5764	0.1718	+80	+48
$\kappa$ Virginis	4.3	1.64	4.1	9 49.7	11 40.1	-9 37.4	+0.9084	0.5769	0.1704	+80	+18
B. A. C. 4828	6.0	1.55	1.8	11 53.9	22 3.4	+0 23.6	+1.2849	0.5793	0.1599	+78	+56
$\xi$ Libræ	5.9	1.55	1.1	11 30.4	4 5 27.0	+7 31.0	-0.2616	0.5812	0.1514	+16	-50
$\zeta$ Libræ	5.8	+1.54	-1.1	-11 1.4	6 28.1	+8 29.9	-0.9058	0.5814	-0.1501	-22	-90
17 Libræ	7.2	1.53	1.0	10 46.2	7 6.6	+9 7.0	-1.2585	0.5815	0.1493	-55	-90
18 Libræ	6.2	1.52	-1.1	10 45.6	7 22.9	+9 22.7	-1.3099	0.5816	-0.1490	-68	-90
NEW MOON.											
B. A. C. 6287	6.0	+1.53	+10.9	-18 47.2	8 0 5.3	-1 11.2	+0.1023	0.5806	+0.0055	+23	-29
B. A. C. 6294	5.2	1.53	11.0	18 27.9	0 37.6	-0 40.0	-0.2309	0.5804	0.0066	+3	-49
$d$ Sagittarii	4.9	1.60	12.6	19 7.2	20 39.8	-5 20.7	+0.9644	0.5721	0.0430	+71	+24
$\rho^1$ Sagittarii	3.9	1.60	12.9	18 1.5	22 27.9	-3 36.4	-0.1171	0.5713	0.0460	+14	-41
$\rho^2$ Sagittarii	6.1	1.61	12.7	18 29.0	22 31.6	-3 32.9	+0.3711	0.5713	0.0462	+42	-13
B. A. C. 6658	7.0	+1.62	+13.0	-18 33.0	9 1 17.7	-0 52.6	+0.5783	0.5699	+0.0510	+58	-2
B. A. C. 6710	6.0	1.64	13.2	18 26.5	5 17.4	+2 58.8	+0.6805	0.5677	0.0576	+68	+5
$e^1$ Sagittarii	5.6	1.63	13.7	16 30.6	6 57.6	+4 35.5	-1.2777	0.5671	0.0604	-70	-90
Lalande 39247	7.4	1.75	15.1	15 17.4	10 3 41.2	+0 37.1	-1.0096	0.5559	0.0920	-33	-90
Piazzi xx, 194	6.2	1.77	14.9	16 51.1	8 5.2	+4 52.4	+1.0923	0.5535	0.0980	+73	+34
$\tau^1$ Capricorni	7.0	+1.78	+15.2	-15 28.6	8 57.8	+5 43.3	-0.3056	0.5530	+0.0992	+9	-54
$\tau^2$ Capricorni	5.3	1.78	15.3	15 17.3	9 52.2	+6 35.9	-0.4182	0.5525	0.1004	+2	-62
W. B. xx, 1293	6.0	1.84	15.7	14 51.0	19 6.8	-8 27.4	+0.0903	0.5474	0.1121	+32	-29
9 Aquarii	7.0	1.81	16.0	13 54.1	20 17.7	-7 18.8	-0.8052	0.5469	0.1135	-19	-90
18 Aquarii	5.4	1.93	16.3	13 17.2	11 7 29.7	+3 31.8	-0.1329	0.5409	0.1261	+21	42
$\lambda$ Capricorni	5.4	+2.01	+16.8	-11 48.3	18 35.2	-9 43.2	-0.2918	0.5354	+0.1370	+14	-52
B. A. C. 7620	6.5	2.03	17.2	10 45.6	22 8.6	-6 16.3	-0.9421	0.5338	0.1402	-25	-90
B. A. C. 7697	6.8	2.11	17.0	10 54.6	12 5 4.6	+0 27.1	+0.2127	0.5308	0.1460	+43	-23
B. A. C. 7774	6.2	2.12	17.4	9 30.8	9 58.8	+5 12.5	-0.5933	0.5287	0.1497	-2	76
67 Aquarii	6.2	2.27	17.8	7 27.6	23 37.2	-5 33.3	-0.7490	0.5240	0.1588	-9	-90
$\lambda$ Aquarii	3.8	+2.31	+17.4	-8 5.2	13 4 31.1	-0 48.0	+0.7249	0.5225	+0.1615	+81	+6
20 Piscium	5.7	2.63	17.5	3 17.4	14 9 51.8	+3 42.0	+0.3467	0.5172	0.1724	+55	-15
W. B. xxiii, 1069	6.9	2.72	17.9	-0 48.6	16 11.6	+9 51.1	-1.3020	0.5170	0.1736	-56	-90
B. A. C. 237	6.7	3.05	16.7	+2 52.1	15 19 40.4	-11 27.0	-0.5693	0.5192	0.1740	+3	-73
B. A. C. 243	7.3	3.07	16.5	3 34.2	20 44.7	-10 24.6	-1.1563	0.5194	0.1738	-37	-86
$\mu$ Piscium	6.1	+3.15	+16.1	+4 24.1	16 3 20.4	-4 0.4	-0.9279	0.5208	+0.1727	-20	-86
$\gamma$ Piscium	5.2	3.33	14.9	5 39.2	16 5.0	+8 22.1	-0.1234	0.5245	0.1690	+27	-40
64 Ceti	5.7	3.57	12.5	8 7.4	17 13 12.5	+4 52.0	+0.6427	0.5326	0.1587	+81	+3
65 Ceti	4.5	3.59	12.5	8 24.0	14 1.9	+5 39.8	-0.4721	0.5329	0.1582	+65	-6
$\xi$ Arietis	5.4	3.70	12.0	10 10.8	19 56.5	+11 23.7	-0.5407	0.5357	0.1542	+5	-66
B. A. C. 755	7.0	+3.73	+12.8	+10 8.2	20 54.7	-11 39.9	-0.3452	0.5362	+0.1536	+15	-52
25 Arietis	7.3	3.74	11.4	9 46.5	21 14.9	-11 20.3	+0.0993	0.5364	0.1533	+40	-25
38 Arietis	5.2	3.84	10.6	12 2.1	18 5 53.1	-2 58.2	-1.0650	0.5408	0.1466	-30	-78
W. B. ii, 1033	5.9	3.95	8.8	12 49.2	16 17.5	+7 6.5	-0.4218	0.5464	0.1371	+11	-55
B. A. C. 987	6.3	3.96	8.6	12 41.2	18 40.8	+9 25.4	+0.0469	0.5475	0.1347	+37	-26
W. B. iii, 275	6.2	+4.01	+6.9	+12 17.5	19 0 46.4	-8 40.9	+1.2710	0.5513	+0.1282	+90	+58

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.												
DECEMBER.												
THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Parallels.
Name.	Mag.	Red'ns from 1904.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	y'	x'	y'	N.	S.	
		$\Delta\alpha$	$\Delta\delta$		d h m	h m						
W. B. (2), iv. 59	6.4	+4.32	+ 2.7	+17 1.9	19 23 3.1	-11 8.7	-1.2365	0.5643	+0.1000	-51	-73	
48 Tauri	6.4	4.28	2.2	15 9.7	20 0 32.8	- 9 42.1	+0.8970	0.5651	0.0978	+90	+27	
γ Tauri	3.9	4.30	1.6	15 23.8	2 21.2	- 7 57.4	+0.8211	0.5662	0.0952	+90	+23	
55 Tauri	7.3	4.32	1.7	16 17.5	2 23.6	- 7 55.1	-0.1240	0.5662	0.0951	+27	-31	
δ <sup>1</sup> Tauri	4.0	4.37	1.6	17 19.1	3 43.9	- 6 37.6	-1.0857	0.5669	0.0932	-33	-73	
63 Tauri	5.6	+4.34	+ 1.4	+16 33.2	3 57.6	- 6 24.4	-0.2545	0.5671	+0.0928	+20	-39	
δ <sup>2</sup> Tauri	4.7	4.36	1.4	17 13.3	4 15.2	- 6 7.3	-0.9355	0.5672	0.0924	-20	-73	
70 Tauri	6.3	4.32	1.0	15 43.3	4 57.6	- 5 26.4	+0.7181	0.5677	0.0913	+90	+17	
71 Tauri	6.0	4.32	0.9	15 24.0	5 17.3	- 5 7.3	+1.0884	0.5678	0.0908	+90	+42	
75 Tauri	5.3	4.34	0.8	16 8.7	6 12.9	- 4 13.7	+0.3830	0.5683	0.0894	+59	- 3	
δ <sup>1</sup> Tauri	3.9	+4.33	+ 0.7	+15 45.0	6 16.6	- 4 10.2	+0.8077	0.5684	+0.0893	+90	+23	
δ <sup>2</sup> Tauri	3.6	4.33	0.7	15 39.5	6 19.1	- 4 7.7	+0.9072	0.5684	0.0893	+90	+29	
80 Tauri	5.6	4.32	0.5	15 25.7	6 58.9	- 3 29.3	+1.2094	0.5688	0.0883	+90	+55	
B. A. C. 1391	5.0	4.34	0.5	15 59.1	7 9.5	- 3 19.0	+0.6358	0.5689	0.0880	+82	+12	
81 Tauri	5.5	4.33	0.4	15 29.0	7 12.3	- 3 16.4	+1.1712	0.5689	0.0880	+90	+51	
B. A. C. 1394	7.5	+4.33	+ 0.5	+15 56.5	7 15.3	- 3 13.5	+0.6911	0.5690	+0.0879	+90	+15	
85 Tauri	6.5	4.35	+ 0.4	15 38.8	7 44.6	- 2 45.1	+1.0460	0.5692	0.0871	+90	+39	
B. A. C. 1406	7.5	4.35	- 0.2	16 7.3	8 31.7	- 1 59.7	+0.6112	0.5697	0.0859	+80	+11	
a Tauri	1.0	4.36	0.2	16 19.0	9 32.1	- 1 1.4	+0.4900	0.5702	0.0843	+68	+ 4	
89 Tauri	6.5	4.35	0.3	15 50.5	10 31.9	- 0 3.7	+1.0750	0.5707	0.0827	+90	+42	
δ <sup>2</sup> Tauri	4.8	+4.35	- 0.4	+15 43.7	11 1.7	+ 0 25.0	+1.2353	0.5711	+0.0820	+90	+60	
B. A. C. 1526	5.8	4.42	2.2	17 0.1	18 57.2	+ 8 3.8	+0.4875	0.5752	0.0690	+67	+ 5	
104 Tauri	5.1	4.52	3.2	18 30.9	23 16.6	-11 45.9	-0.8197	0.5773	0.0615	-13	-71	
111 Tauri	5.2	4.48	5.2	17 17.6	21 6 36.8	- 4 41.7	+0.8657	0.5807	0.0486	+90	+30	
115 Tauri	5.4	4.48	5.4	17 52.7	7 47.2	- 3 33.8	+0.3087	0.5812	0.0465	+54	- 3	
117 Tauri	6.3	+4.46	- 3.6	+17 9.5	8 9.9	- 3 12.0	+1.0799	0.5814	+0.0458	+90	+46	
W. B. (2), v. 606	7.0	4.49	5.7	18 17.2	8 41.9	- 2 41.1	-0.0756	0.5817	0.0448	+30	-23	
119 Tauri	4.6	4.50	5.9	18 31.3	9 55.6	- 1 30.2	-0.2675	0.5822	0.0426	+19	-34	
120 Tauri	5.3	4.50	6.1	18 28.2	10 29.2	- 0 57.8	-0.1907	0.5824	0.0415	+24	-31	
B. A. C. 1796	7.5	4.52	7.1	18 56.3	14 16.6	+ 2 41.4	-0.5339	0.5839	0.0345	+ 4	-51	
127 Tauri	6.3	+4.52	- 7.1	+18 55.9	14 27.2	+ 2 51.6	-0.5209	0.5839	+0.0341	+ 5	-51	
130 Tauri	5.5	4.48	7.6	17 41.5	16 23.7	+ 4 43.8	-0.8337	0.5846	0.0304	+90	+29	
γ <sup>3</sup> Orionis	5.1	4.54	9.3	19 41.4	23 5.8	+11 11.1	-1.0826	0.5870	0.0178	-34	-70	
71 Orionis	5.1	4.50	10.6	19 11.2	22 3 52.3	- 8 13.1	-0.4970	0.5884	+0.0083	+ 7	-47	
20 Geminorum	6.3	4.46	12.3	17 50.6	11 8.7	- 1 13.0	+0.8994	0.5901	-0.0061	+90	+15	
21 Geminorum	6.5	+4.46	-12.2	+17 50.9	11 9.0	- 1 12.7	+0.8941	0.5901	-0.0061	+90	+36	
22 Geminorum	7.2	4.46	12.6	19 30.0	12 5.7	- 0 13.1	-0.8177	0.5903	0.0080	-14	-70	
26 Geminorum	5.1	4.43	13.3	17 44.1	15 20.1	+ 2 49.0	+0.9658	0.5909	0.0144	+90	+40	
W. B. (2), vi. 1630	6.2	4.39	15.2	17 53.3	23 35.8	+10 46.1	+0.6204	0.5919	0.0309	+81	+17	
B. A. C. 2432	7.0	4.34	17.0	18 27.2	23 8 5.6	- 5 3.5	-0.2950	0.5923	0.0477	+18	-37	
W. B. (2), vii. 685	5.6	+4.31	-17.7	+17 17.2	11 42.0	- 1 35.2	+0.7160	0.5923	-0.0548	+90	+20	
f Geminorum	5.2	4.30	18.3	17 53.3	14 51.0	+ 1 26.7	-0.0833	0.5922	0.0607	+30	-26	
B. A. C. 2649	6.3	4.21	19.6	16 46.3	22 42.9	+ 9 0.8	+0.5190	0.5916	0.0759	+70	+ 7	
3 Cancrī	6.0	4.21	19.9	17 34.0	23 38.2	+ 9 53.9	-0.3627	0.5915	0.0776	+14	-44	
5 Cancrī	6.4	4.20	19.9	16 42.9	23 56.7	+10 11.7	+0.4826	0.5914	0.0781	+67	+ 4	
ζ Cancrī	5.0	+4.17	-20.9	+17 55.9	24 4 20.8	- 9 34.1	-1.1202	0.5908	-0.0863	-37	-72	
A Leonis	4.6	3.50	23.9	10 27.7	26 5 8.8	-10 34.2	+0.3386	0.5779	0.1588	+55	-12	
B. A. C. 3538	7.0	3.42	23.7	9 26.5	11 20.5	- 4 35.7	+0.3663	0.5759	0.1652	+57	-11	
44 Leonis	6.2	3.40	23.7	9 16.0	12 38.9	- 3 20.1	+0.3270	0.5755	0.1664	+54	-14	
37 Sextantis	6.2	3.29	23.0	6 52.4	21 44.4	+ 5 26.0	+1.1973	0.5730	0.1744	+90	+44	
55 Leonis	6.6	+3.23	-22.9	+ 6 41.5	27 2 5.6	+ 9 37.8	+0.6143	0.5718	-0.1776	+79	+ 1	
82 Leonis	6.9	3.00	21.5	3 49.4	15 10.6	- 1 44.7	+1.1372	0.5688	0.1853	+90	+36	
83 Leonis	6.1	2.99	21.1	3 31.8	15 41.8	- 1 14.5	+1.3380	0.5686	0.1856	+90	+70	
89 Leonis	6.2	3.02	21.2	3 35.2	19 2.9	+ 1 59.6	+0.6562	0.5680	0.1870	+82	+ 2	
β Virginis	3.7	3.01	20.4	+ 2 18.0	28 2 16.5	+ 8 58.1	+0.5987	0.5668	0.1893	+76	- 1	
13 Virginis	6.3	+2.83	-18.3	- 0 15.5	14 49.1	- 2 55.4	+0.8013	0.5653	-0.1911	+89	+11	



## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1904.0.		Apparent Declination.	Washington Mean Time.	Hour Angle. //	$\gamma$	$x'$	$y'$	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		$s$	$"$	$^{\circ}$	$d$ $h$ $m$	$h$ $m$				$^{\circ}$	$^{\circ}$
$\eta$ Virginis	4.1	+2.81	-18.2	- 0 8.3	28 15 22.5	- 2 23.1	+0.5734	0.5653	-0.1912	+73	- 3
$\gamma$ Virginis ( <i>mean</i> )	2.8	2.68	17.0	0 55.6	29 1 9.1	+ 7 3.4	-0.4940	0.5648	0.1905	+ 7	-66
38 Virginis	6.2	2.66	15.6	3 2.2	6 18.2	-11 58.2	+0.6676	0.5648	0.1894	+83	+ 2
$k$ Virginis	5.9	2.65	15.2	3 17.9	9 11.7	- 9 10.6	+0.3874	0.5648	0.1886	+58	-13
46 Virginis	6.1	2.64	15.2	2 51.4	9 37.0	- 8 46.2	-0.1405	0.5648	0.1885	+26	-43
48 Virginis	6.6	+2.62	-15.0	- 3 9.1	11 6.1	- 7 20.2	-0.1215	0.5649	-0.1880	+27	-41
51 Virginis	4.4	2.62	14.0	5 1.8	13 48.1	- 4 43.7	+1.2821	0.5650	0.1870	+85	+52
66 Virginis	5.8	2.56	13.3	4 40.0	20 20.2	+ 1 34.9	-0.3015	0.5654	0.1842	+17	-52
$\iota^1$ Virginis	6.1	2.54	12.5	5 58.7	22 57.7	+ 4 6.9	+0.5515	0.5657	0.1828	+70	- 4
$\iota^2$ Virginis	4.9	2.53	12.5	5 45.8	23 39.4	+ 4 47.2	+0.2065	0.5658	0.1824	+45	-23
80 Virginis	5.8	+2.50	-12.5	- 4 54.6	30 1 14.8	+ 6 19.2	-0.9512	0.5659	-0.1815	-21	-90
B. A. C. 4647	6.4	2.45	10.4	7 35.4	9 54.8	- 9 18.8	+0.2272	0.5671	0.1758	+46	-22
94 Virginis	6.8	2.41	9.3	8 26.2	14 56.1	- 4 27.8	+0.2182	0.5678	0.1719	+45	-22
95 Virginis	5.7	2.43	9.1	8 51.5	15 7.3	- 4 17.1	+0.6163	0.5679	0.1718	+74	0
$\kappa$ Virginis	4.3	2.41	8.3	9 49.8	17 50.9	- 1 39.1	+1.1431	0.5683	0.1695	+80	+36
$\xi^1$ Libræ	5.9	+2.26	- 5.0	-11 30.5	31 12 7.1	- 8 1.3	-0.0730	0.5719	-0.1509	+28	-39
$\xi^2$ Libræ	5.8	2.24	4.9	11 1.4	13 10.1	- 7 0.5	-0.7275	0.5722	0.1497	-11	-90
17 Libræ	7.2	2.23	5.0	10 46.3	13 49.7	- 6 22.3	-1.0858	0.5723	0.1489	-36	-90
18 Libræ	6.2	+2.21	- 5.0	-10 45.6	14 6.4	- 6 6.2	-1.1379	0.5724	-0.1486	-41	-90

## OCCULTATIONS VISIBLE AT WASHINGTON DURING THE YEAR 1904.

Date.	THE STAR'S		IMMERSION.						EMERSION.						Duration of Oc- cultation.
			Washington.		Angle from		Washington.		Angle from						
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.					
			h m	h m	°	°	h m	h m	°	°	h m	h m			
Jan. 2	26 Geminorum	5.1	1 27.1	6 42.3	84	138	2 27.0	7 42.1	271	325	0 59.8				
3	1 Cancrī	5.9	7 11.1	12 21.4	90	110	8 26.9	13 37.0	295	278	1 15.6				
5	B. A. C. 3398	6.0	6 30.0	11 32.6	163	211	7 8.9	12 11.4	231	275	0 38.8				
9	82 Virginis	5.3	10 10.3	14 56.5	95	136	11 19.9	16 5.9	315	347	1 9.4				
22	W. B. xxiii, *1069	6.9	1 47.5	5 44.1	34	4	2 59.7	6 56.1	273	232	1 12.0				
25	ξ Arietis	5.4	2 40.8	6 25.3	87	79	4 3.4	7 47.7	231	196	1 22.4				
27	75 Tauri	5.3	11 23.0	14 58.3	99	45	12 11.9	15 47.1	256	202	0 48.8				
28	111 Tauri	5.2	10 35.9	14 7.4	148	94	11 8.4	14 39.8	217	164	0 32.4				
31	29 Cancrī	5.9	9 9.3	12 29.2	128	107	10 19.5	13 39.2	267	226	1 10.0				
Feb. 1	o Leonis	3.8	14 38.1	17 53.1	115	63	15 20.0	18 46.9	292	241	0 53.8				
6	2 Libræ	6.3	15 16.2	18 11.5	107	92	16 38.6	19 33.7	292	261	1 22.2				
6	B. A. C. 4772	6.6	16 8.4	19 3.5	73	48	17 12.9	20 7.9	322	286	1 4.4				
8	49 Libræ †	5.6	9 55.7	12 44.0	129	181	10 49.7	13 37.8	262	311	0 53.8				
22	W. B. ii, 1033	5.9	8 20.5	10 14.1	28	335	8 57.0	10 50.5	315	263	0 36.4				
24	B. A. C. 1526	5.8	9 38.6	11 24.1	73	18	10 36.4	12 21.7	288	235	0 57.6				
Mar. 25	130 Tauri	5.5	5 6.7	6 49.0	106	124	6 27.1	8 9.2	250	227	1 20.2				
6	η Libræ	5.5	12 4.3	13 6.2	86	127	13 12.8	14 14.4	311	342	1 8.2				
7	24 Scorpī	5.2	14 10.7	15 8.3	78	108	15 26.7	16 24.1	309	325	1 15.8				
9	B. A. C. 6287	6.0	16 22.1	17 11.4	75	101	17 49.9	18 39.0	286	299	1 27.6				
10	ρ Sagittarii	3.9	16 47.3	17 32.6	76	107	18 16.2	19 1.2	276	289	1 28.6				
22	B. A. C. 1406	7.5	7 0.4	7 0.1	154	107	7 28.3	7 28.0	196	146	0 27.9				
22	α Tauri	1.0	8 0.9	8 0.5	106	53	9 6.9	9 6.3	249	195	1 5.8				
24	20 Geminorum	6.3	9 49.0	9 40.4	34	341	10 18.7	10 10.0	343	288	0 29.6				
24	21 Geminorum	6.5	9 50.8	9 42.2	31	338	10 17.5	10 8.8	346	291	0 26.6				
26	29 Cancrī	5.9	8 37.3	8 21.0	119	108	9 55.1	9 38.6	275	239	1 17.6				
Apr. 27	o Leonis †	3.8	15 41.9	15 20.6	94	42	16 31.3	16 9.8	300	248	0 49.2				
1	κ Virginis †	4.3	8 3.6	7 23.9	54	105	8 34.7	7 54.9	345	35	0 31.0				
1	2 Libræ	6.3	13 53.9	13 13.2	146	152	15 1.1	14 20.2	259	248	1 7.0				
1	B. A. C. 4772	6.6	14 27.5	13 46.7	110	108	15 47.9	15 6.9	292	270	1 20.2				
2	α Libræ	6.3	15 47.3	15 2.4	133	126	17 1.1	16 16.0	259	235	1 13.6				
8	τ Capricorni	5.3	15 14.5	14 6.1	79	129	16 23.5	15 14.9	268	312	1 8.8				
10	B. A. C. 7774	6.2	17 26.5	16 9.8	77	125	18 39.9	17 23.0	252	294	1 13.2				
21	λ Geminorum	3.6	12 28.9	10 29.8	132	78	13 17.7	11 18.4	251	198	0 48.6				
30	η Libræ	5.5	11 22.3	8 48.1	78	123	12 19.3	9 44.9	318	357	0 56.8				
30	θ Libræ	4.3	17 35.8	15 0.5	169	151	18 5.9	15 30.5	213	183	0 30.0				
May 1	24 Scorpī	5.2	11 55.2	9 16.9	81	128	12 55.8	10 17.3	308	349	1 0.4				
8	67 Aquarii	6.2	17 2.7	13 56.0	3	54	17 22.6	14 15.8	327	17	0 19.8				
19	1 Cancrī	5.9	11 33.6	7 44.6	90	36	12 34.7	8 45.6	301	246	1 1.0				
21	B. A. C. 3398	6.0	14 47.6	10 50.2	164	112	15 21.7	11 24.2	236	184	0 34.0				
26	B. A. C. 4772	6.6	11 47.9	7 31.4	161	194	12 38.1	8 21.4	246	270	0 50.0				
26	B. A. C. 4828	6.0	19 5.9	14 48.1	65	18	19 56.2	15 37.3	318	268	0 49.2				
27	α Libræ	6.3	13 29.0	9 8.2	149	173	14 31.3	10 10.3	252	263	1 2.1				
30	Y Sagittarii	Var.	21 12.3	16 38.4	8	333	21 32.3	16 58.4	238	200	0 20.0				
June 9	25 Arietis	7.3	21 51.5	16 38.2	82	134	22 58.8	17 45.4	234	282	1 7.2				
22	96 Virginis	6.5	12 45.7	6 42.8	122	141	14 6.9	8 3.8	288	287	1 21.0				
24	49 Libræ	5.6	14 22.8	8 11.8	89	109	15 42.9	9 31.6	306	309	1 19.8				
30	18 Aquarii	5.4	20 7.0	13 31.5	3	20	20 39.9	14 4.3	320	330	0 32.8				
July 1	B. A. C. 7697	6.8	16 39.9	10 1.0	102	152	17 41.9	11 2.8	231	277	1 1.8				
21	η Libræ	5.5	14 35.8	6 38.5	94	108	15 59.1	8 1.7	302	297	1 23.2				
22	24 Scorpī	5.2	16 58.2	8 56.6	52	47	17 58.1	9 56.4	326	308	0 59.8				

NOTE.—The angles of position are counted from the north point and vertex of the Moon's limb, toward the east.

† Immersion below the horizon of Washington.

‡ Emersion below the horizon of Washington.

## OCCULTATIONS VISIBLE AT WASHINGTON DURING THE YEAR 1904.

Date.	THE STAR'S		IMMERSSION.				EMERSON.				Duration of Oc- cultation.
			Washington.		Angle from		Washington.		Angle from		
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.	
			h m	h m	°	°	h m	h m	°	°	h m
July 25	$\rho^2$ Sagittarii	6.1	16 38.1	8 24.8	78	110	18 3.3	9 49.8	277	293	1 25.0
25	B. A. C. 6658	7.0	21 26.0	13 11.9	151	125	21 47.5	13 33.3	182	152	0 21.4
Aug. 5	48 Tauri †	6.4	21 8.0	12 10.7	92	145	21 59.6	13 2.1	241	294	0 51.4
5	$\gamma$ Tauri	3.9	22 53.6	13 56.0	93	146	23 52.8	14 55.0	236	289	0 59.0
5	70 Tauri	6.3	2 7.4	17 9.2	112	157	3 12.7	18 14.4	217	246	1 5.2
20	$\gamma$ Sagittarii †	Var.	22 23.2	12 26.7	71	27	23 28.1	13 31.5	274	224	1 4.8
23	W. B. xx, 1293 †	6.0	1 28.2	15 19.5	114	67	2 15.0	16 6.1	209	159	0 46.6
24	$\lambda$ Capricorni	5.4	1 46.2	15 33.4	32	347	2 40.5	16 27.6	286	237	0 54.2
Sept. 2	B. A. C. 1526	5.8	2 7.2	15 19.0	11	61	2 39.1	15 50.8	322	8	0 31.8
3	130 Tauri	5.5	23 12.8	12 21.1	38	91	23 52.3	13 0.5	306	359	0 39.4
29	85 Tauri	6.5	21 50.8	9 17.2	112	165	22 36.8	10 3.0	221	274	0 45.8
29	B. A. C. 1406	7.5	22 57.2	10 23.4	19	72	23 30.1	10 56.2	312	6	0 32.8
30	117 Tauri	6.3	23 8.7	10 30.9	112	164	23 57.9	11 19.9	228	282	0 49.0
Oct. 1	20 Geminorum	6.3	3 27.2	14 44.7	102	154	4 43.2	16 0.5	250	292	1 15.8
1	21 Geminorum	6.5	3 27.5	14 45.0	101	153	4 44.1	16 1.4	251	293	1 16.4
2	W. B. (2), vii, 685	5.6	4 46.9	16 0.3	53	103	5 50.6	17 3.9	314	353	1 3.6
11	$\eta$ Libræ †	5.5	20 21.0	7 0.4	108	61	21 19.7	7 59.0	265	214	0 58.6
12	24 Scorpii	5.2	20 22.8	6 58.3	84	42	21 28.2	8 3.5	281	232	1 5.2
15	B. A. C. 6658	7.0	21 43.3	8 6.8	163	134	21 48.9	8 12.4	171	141	0 5.6
26	48 Tauri	6.4	21 49.3	7 29.5	109	162	22 37.2	8 17.3	222	274	0 47.8
26	$\gamma$ Tauri	3.9	23 49.1	9 28.9	119	172	0 37.6	10 17.3	208	260	0 48.4
26	70 Tauri	6.3	3 27.8	13 7.0	119	142	4 33.4	14 12.4	213	208	1 5.4
26	75 Tauri	6.3	5 33.3	15 2.2	78	51	6 48.9	16 27.6	264	217	1 25.4
26	B. A. C. 1391	5.0	7 2.3	16 40.9	139	90	7 46.6	17 25.1	209	157	0 44.2
26	B. A. C. 1406	7.5	8 41.6	18 19.9	117	63	9 38.5	19 16.7	236	183	0 56.8
26	$\alpha$ Tauri	1.0	9 49.7	19 27.9	79	25	10 48.5	20 26.5	277	224	0 58.6
Nov. 7	115 Tauri	5.4	8 48.4	18 22.8	19	325	9 10.0	18 44.4	344	289	0 21.6
4	38 Virginis †	6.2	6 22.8	15 26.2	75	126	7 6.5	16 9.8	324	15	0 43.6
20	65 Ceti	4.5	19 53.9	3 56.2	34	85	20 40.5	4 42.6	287	339	0 46.4
20	25 Arietis	7.3	5 27.2	13 27.9	58	11	6 39.4	14 39.9	269	218	1 12.0
23	B. A. C. 1526	5.8	1 13.1	9 2.6	76	129	2 27.3	10 16.6	256	303	1 14.0
24	130 Tauri	5.5	22 52.1	6 38.1	112	166	23 38.6	7 24.5	231	283	0 46.4
25	W. B. (2) vi, 1630	6.2	8 47.5	16 30.0	115	72	10 1.5	17 43.8	263	211	1 13.8
26	B. A. C. 2649	6.3	7 58.8	15 35.4	102	99	9 22.0	16 58.4	284	247	1 23.0
26	5 Cancræ	6.4	9 54.3	17 30.6	67	24	10 52.7	18 28.8	324	273	0 58.2
Dec. 30	89 Leonis †	6.2	4 44.2	12 5.7	106	157	5 38.0	12 59.3	286	338	0 53.6
1	MARS		6 49.7	14 6.9	110	161	7 51.1	15 8.1	290	339	1 1.2
2	$\beta$ Virginis	4.9	8 11.4	15 24.4	88	138	9 6.7	16 19.6	316	2	0 55.2
9	B. A. C. 6710	6.0	23 9.7	5 56.7	86	45	0 15.7	7 2.5	246	199	1 5.8
14	20 Piscium	5.7	4 23.1	10 49.6	62	14	5 27.3	11 53.6	255	204	1 4.0
17	64 Ceti	5.7	8 6.3	14 20.3	138	87	8 33.8	14 47.7	195	143	0 27.4
20	B. A. C. 1391	5.0	23 17.4	5 21.1	74	128	0 21.0	6 24.5	254	308	1 3.4
20	B. A. C. 1394	7.5	23 22.6	5 26.3	87	140	0 25.0	6 28.5	242	295	1 2.2
20	B. A. C. 1406	7.5	0 52.0	6 55.5	90	143	2 3.2	8 6.5	236	283	1 11.0
20	$\alpha$ Tauri	1.0	2 13.7	8 16.9	83	129	3 35.1	9 38.1	245	271	1 21.2
21	111 Tauri	5.2	22 53.5	4 53.4	126	179	23 31.6	5 31.4	213	266	0 48.0
21	115 Tauri	5.4	0 31.8	6 31.4	358	53	0 42.2	6 41.8	338	33	0 10.4
26	B. A. C. 3538	7.0	3 52.2	9 31.5	98	150	4 47.7	10 26.9	288	340	0 55.4
26	44 Leonis	6.2	5 11.5	10 50.6	98	150	6 14.3	11 53.2	292	343	1 2.6
28	$\eta$ Virginis	4.1	8 25.2	13 56.0	145	195	9 23.4	14 54.0	262	302	0 58.0

NOTE.—The angles of position are counted from the north point and vertex of the Moon's limb, toward the east.

† Immersion below the horizon of Washington.

‡ Emerison below the horizon of Washington.

## FOR WASHINGTON MEAN NOON.

Date.	<i>k</i>	<i>i</i>	$\theta$	<i>L</i>	Date.	<i>k</i>	<i>i</i>	$\theta$	<i>L</i>
Jan. 0	0.615	76.7	351.9	59.7	July 3	0.950	25.7	186.9	67.8
5	0.407	100.7	347.4	59.4	8	0.997	6.4	226.3	65.0
10	0.171	131.0	341.7	35.8	13	0.983	14.9	349.4	57.0
15	0.018	164.3	314.5	4.6	18	0.934	29.7	4.1	47.7
20	0.045	155.5	196.3	8.6	23	0.873	41.7	10.9	40.6
25	0.194	127.8	183.5	31.7	28	0.808	51.9	15.7	35.8
30	0.357	106.5	179.0	40.8	Aug. 2	0.747	60.4	19.2	32.9
Feb. 4	0.494	90.7	175.2	40.2	7	0.687	68.1	22.0	30.8
9	0.598	78.7	171.5	36.5	12	0.625	75.6	24.3	30.3
14	0.680	69.0	167.8	32.9	17	0.556	83.6	26.1	30.7
19	0.741	61.3	164.0	30.4	22	0.477	92.5	23.2	32.2
24	0.791	54.4	160.2	28.8	27	0.381	103.7	30.3	32.0
29	0.831	48.6	156.6	28.2	Sept. 1	0.279	116.3	32.9	30.1
Mar. 5	0.869	42.4	153.1	28.9	6	0.158	133.2	37.3	22.3
10	0.912	34.4	149.5	31.2	11	0.049	154.4	48.2	8.8
15	0.948	26.3	145.4	34.9	16	0.005	171.6	134.8	1.1
20	0.979	16.4	139.3	40.8	21	0.080	146.9	194.9	16.3
25	0.998	5.1	107.3	49.1	26	0.269	117.5	203.4	45.7
30	0.988	12.6	346.2	57.7	Oct. 1	0.506	89.3	207.1	65.2
Apr. 4	0.925	31.7	337.0	68.0	6	0.715	64.6	209.6	65.9
9	0.799	53.3	335.3	70.1	11	0.855	44.5	211.4	56.3
14	0.630	75.0	335.8	63.2	16	0.939	28.8	212.3	45.5
19	0.453	95.4	336.7	51.9	21	0.978	16.9	213.9	37.1
24	0.299	113.8	337.1	37.0	26	0.995	7.5	217.3	31.2
29	0.168	131.6	338.0	24.0	31	1.000	0.9	316.9	27.6
May 4	0.071	149.1	338.2	11.1	Nov. 5	0.996	6.8	16.5	25.5
9	0.013	166.8	340.0	2.3	10	0.987	13.2	21.7	24.6
14	0.002	175.4	140.4	0.3	15	0.971	19.5	19.8	24.8
19	0.034	158.6	151.2	5.6	20	0.951	25.5	17.1	26.2
24	0.098	143.4	152.5	14.1	25	0.921	32.6	13.9	28.9
29	0.181	129.7	153.8	22.2	30	0.878	40.8	10.3	33.2
June 3	0.271	117.2	155.5	28.6	Dec. 5	0.823	49.6	6.4	39.9
8	0.368	105.2	157.7	34.2	10	0.720	63.9	2.3	48.0
13	0.474	92.9	160.6	39.8	15	0.576	81.3	358.5	56.4
18	0.590	79.6	164.3	46.5	20	0.368	105.2	354.9	54.9
23	0.718	64.1	169.2	54.9	25	0.140	136.0	349.7	30.1
28	0.849	45.7	175.8	61.7	30	0.008	169.7	309.2	2.0
July 3	0.950	25.7	186.9	67.8					

## NOTATION.

*k*=the ratio of the area of the illuminated portion of the apparent disk to the area of the entire apparent disk regarded as circular.

*i*=the angle between the Sun and Earth, as seen from the planet.

$\theta$ =the angle which the line joining the cusps, or extremities of the illuminated portion, makes with the meridian.

*L*=the brilliancy of the disk. The unit of *L* is the amount of light received by an eye from a circular disk with the same albedo as the planet, subtending an angular radius of one second of arc, situated at distance unity from the Sun, and illuminated by the latter as the mean disk of the planet is illuminated.

## FOR WASHINGTON MEAN NOON.

Date.	$k$	$i$	$\theta$	$L$	Date.	$k$	$i$	$\theta$	$L$
Jan. 0	0.654	72.1	196.5	107.3	July 3	1.000	2.2	206.9	46.9
5	0.673	69.8	194.5	102.3	8	1.000	1.0	285.6	46.9
10	0.692	67.5	192.2	97.6	13	0.999	2.5	338.8	47.0
15	0.709	65.4	189.8	93.1	18	0.999	4.3	352.6	47.1
20	0.725	63.3	187.2	89.2	23	0.998	6.2	358.9	47.3
25	0.741	61.2	184.5	85.6	28	0.995	8.2	34	47.5
30	0.756	59.2	181.7	82.2	Aug. 2	0.992	10.1	6.9	47.7
Feb. 4	0.771	57.2	178.9	79.0	7	0.989	12.1	9.8	47.9
9	0.785	55.3	176.0	76.1	12	0.985	14.0	12.2	48.3
14	0.798	53.4	173.2	73.4	17	0.981	15.9	14.4	48.7
19	0.810	51.5	170.4	70.9	22	0.976	17.8	16.1	49.2
24	0.823	49.6	167.8	68.6	27	0.971	19.7	17.5	49.7
29	0.835	47.8	165.3	66.4	Sept. 1	0.965	21.6	18.7	50.2
Mar. 5	0.847	46.0	162.9	64.5	6	0.959	23.5	19.5	50.7
10	0.858	44.2	160.8	62.7	11	0.952	25.4	20.0	51.3
15	0.869	42.4	158.9	61.0	16	0.945	27.2	20.3	51.9
20	0.879	40.6	157.2	59.4	21	0.938	29.0	20.3	52.6
25	0.889	38.8	155.8	57.9	26	0.930	30.8	20.1	53.5
30	0.898	37.1	154.7	56.6	Oct. 1	0.921	32.6	19.6	54.4
Apr. 4	0.907	35.3	153.8	55.4	6	0.912	34.4	18.8	55.4
9	0.916	33.5	153.2	54.3	11	0.903	36.2	17.7	56.5
14	0.925	31.7	152.8	53.3	16	0.894	37.9	16.4	57.7
19	0.933	30.0	152.7	52.3	21	0.885	39.7	14.8	58.9
24	0.941	28.2	152.9	51.5	26	0.875	41.4	13.1	60.3
29	0.948	26.4	153.4	50.8	31	0.865	43.2	11.1	61.8
May 4	0.955	24.6	154.2	50.2	Nov. 5	0.854	44.9	8.9	63.4
9	0.961	22.7	155.2	49.6	10	0.842	46.7	6.6	65.1
14	0.967	20.9	156.5	49.1	15	0.830	48.5	4.1	67.0
19	0.973	19.0	158.2	48.6	20	0.818	50.3	1.5	69.0
24	0.978	17.1	160.3	48.2	25	0.806	52.1	358.9	71.2
29	0.982	15.2	162.6	47.8	30	0.794	53.9	356.3	73.6
June 3	0.986	13.3	165.2	47.5	Dec. 5	0.781	55.8	353.8	76.2
8	0.990	11.4	168.2	47.3	10	0.768	57.6	351.4	79.1
13	0.993	9.5	171.6	47.1	15	0.754	59.5	349.1	82.2
18	0.995	7.6	175.8	47.0	20	0.739	61.5	347.0	85.5
23	0.997	5.7	181.2	47.0	25	0.723	63.5	345.1	89.0
28	0.999	3.8	189.2	46.9	30	0.707	65.6	343.3	92.9
July 3	1.000	2.2	206.9	46.9	35	0.690	67.7	341.7	97.2

## NOTATION.

$k$  = the ratio of the area of the illuminated portion of the apparent disk to the area of the entire apparent disk regarded as circular.

$i$  = the angle between the Sun and Earth, as seen from the planet.

$\theta$  = the angle which the line joining the cusps, or extremities of the illuminated portion, makes with the meridian.

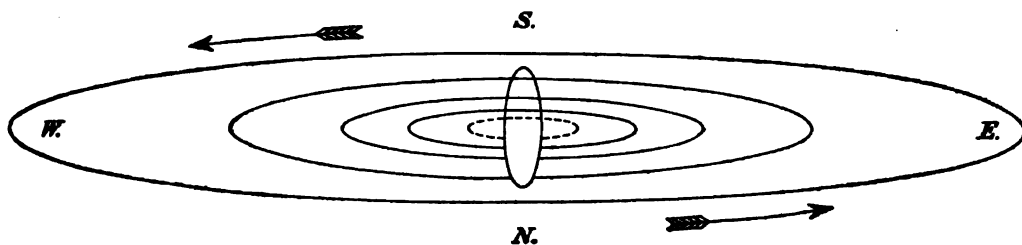
$L$  = the brilliancy of the disk. The unit of  $L$  is the amount of light received by an eye from a circular disk with the same albedo as the planet, subtending an angular radius of one second of arc, situated at distance unity from the Sun, and illuminated by the latter as the mean disk of the planet is illuminated.

MARS not being in opposition during the year 1904 the satellites will not be visible.

APPARENT DISK OF MARS, 1904.

January	1,	0.954
January	31,	0.970
March	1,	0.982
March	31,	0.992
April	30,	0.998
May	30,	1.000
June	29,	0.998
July	29,	0.991
August	28,	0.982
September	27,	0.966
October	27,	0.948
November	26,	0.929
December	26,	0.911

The numbers in this table are the versed sines of the illuminated disk, the apparent diameter of the planet being taken as unity.



*APPARENT ORBITS OF THE SATELLITES OF JUPITER IN 1904,  
AS SEEN IN AN INVERTING TELESCOPE.*

*(The vertical scale is three times the horizontal one.)*

In the above diagram the central vertical ellipse represents the disk of Jupiter, elongated three times in the vertical direction, and the dotted ellipse represents the orbit of Satellite V. The object of the figure is to facilitate the identification of satellites in cases where the diagrams of configurations do not suffice. For example, if two satellites are seen together a reference to the above figure will show which is the inner and which the outer one of the pair.

The ephemeris of the four outer satellites of Jupiter is given on pages 486-507, each month occupying two pages, which contain respectively the times of the phenomena and the diagrams of the configurations. The latter are given for each day, Jupiter being represented by a light disk, ○, in the center of the page, and the relative positions of the satellites at the Washington time stated above the diagrams being indicated by dots. The designation of each satellite is shown by a numeral placed to the right or left of the dot according as the motion of the satellite at the instant in question is toward the east or toward the west—the motion being always toward the numeral. In constructing the diagrams the latitudes of the satellites are always considered zero, except where two or more of them chance to be at nearly the same distance from the planet, when they are placed one above the other according to their apparent latitudes. If at the epoch of any configuration, one or more satellites are projected on the disk of the planet, that phenomenon is indicated by a light disk, ○, at the left-hand side of the page; and if any satellites are invisible on account of being occulted behind the disk of the planet, or eclipsed by its shadow, that circumstance is indicated by a dark disk, ●, at the right-hand side of the page. In both cases, the annexed numerals serve to point out which satellites are thus rendered invisible.

When an observation is made at a different hour from that for which the diagram is constructed, the place of the satellite may be found by transferring its given position to the above diagram, and estimating its motion during the elapsed interval by means of the following table of—

MEAN SYNODIC PERIODS OF THE SATELLITES.

I.	$\begin{array}{cccc} d & h & m & s \\ 1 & 18 & 28 & 35.945 \end{array}$	=	$\begin{array}{cccc} d & & & \\ 1.769 & 860 & 48 & \end{array}$		III.	$\begin{array}{cccc} d & h & m & s \\ 7 & 3 & 59 & 35.854 \end{array}$	=	$\begin{array}{cccc} d & & & \\ 7.166 & 387 & 20 & \end{array}$
II.	$\begin{array}{cccc} 3 & 13 & 17 & 53.735 \end{array}$	=	$\begin{array}{cccc} 3.554 & 094 & 16 & \end{array}$		IV.	$\begin{array}{cccc} 16 & 18 & 5 & 6.928 \end{array}$	=	$\begin{array}{cccc} 16.753 & 552 & 41 & \end{array}$
$\begin{array}{cccc} d & h & m & s \\ 0 & 11 & 57 & 27.635 \end{array} = \begin{array}{cccc} d & & & \\ 0.498 & 236 & 52 & \end{array}$								

## SATELLITE V.

WASHINGTON MEAN TIME OF EVERY TWENTIETH GREATEST ELONGATION.

	d	h			d	h			d	h			d	h		
July	25	7.7	E.		Oct.	23	11.5	E.	July	25	13.7	W.	Oct.	23	17.5	W.
Aug.	4	6.8	E.		Nov.	2	10.6	E.	Aug.	4	12.8	W.	Nov.	2	16.6	W.
	14	17.9	E.			12	9.7	E.		14	11.9	W.		12	15.7	W.
	24	17.0	E.			22	8.8	E.		24	11.0	W.		22	14.8	W.
Sept.	3	16.1	E.		Dec.	2	7.9	E.	Sept.	3	10.1	W.	Dec	2	13.9	W.
	13	15.2	E.			12	7.1	E.		13	9.2	W.		12	13.0	W.
	23	14.3	E.			22	6.2	E.		23	8.3	W.		22	12.2	W.
Oct.	3	13.3	E.			31	17.4	E.	Oct.	3	7.4	W.		32	11.3	W.
	13	12.4	E.							13	6.4	W.				

WASHINGTON MEAN TIME OF SUPERIOR GEOCENTRIC CONJUNCTION.

## SATELLITE I.

Jan.		h m		May		h m		Aug.		h m		Oct.		h m	
2	3	14.0		19	6	39.0		3	9	33.8		18	10	43.2	
3	21	43.8		21	1	9.0		5	4	1.8		20	5	9.1	
5	16	13.6		22	19	39.1		6	22	29.7		21	23	35.1	
7	10	43.5		24	14	9.0		8	16	57.6		23	18	1.0	
9	5	13.3		26	8	38.9		10	11	25.4		25	12	27.0	
10	23	43.2		28	3	8.8		12	5	53.2		27	6	53.0	
12	18	13.2		29	21	38.7		14	0	20.8		29	1	19.1	
14	12	43.1		31	16	8.5		15	18	48.4		30	19	45.2	
16	7	13.2		2	10	38.3		17	13	15.9		Nov. 1	14	11.4	
18	1	43.2		4	5	8.1		19	7	43.4		3	8	37.5	
19	20	13.3		5	23	37.8		21	2	10.7		5	3	3.7	
21	14	43.5		7	18	7.5		22	20	38.1		6	21	29.9	
23	9	13.6		9	12	37.2		24	15	5.3		8	15	56.3	
25	3	43.7		11	7	6.8		26	9	32.5		10	10	22.6	
26	22	13.9		13	1	36.4		28	3	59.5		12	4	49.0	
28	16	44.1		14	20	6.0		29	22	26.7		13	23	15.5	
30	11	14.3		16	14	35.5		31	16	53.6		15	17	42.0	
Feb. 1	5	44.6		18	9	5.0		Sept. 2	11	20.6		17	12	8.6	
3	0	14.9		20	3	34.4		4	5	47.4		19	6	35.3	
4	18	45.2		21	22	3.8		6	0	14.3		21	1	2.0	
6	13	15.4		23	16	33.1		7	18	41.0		22	19	28.8	
8	7	45.8		25	11	2.4		9	13	7.7		24	13	55.6	
10	2	16.2		27	5	31.6		11	7	34.2		26	8	22.6	
11	20	46.5		29	0	0.8		13	2	0.8		28	2	49.6	
13	15	17.0		30	18	30.0		14	20	27.2		29	21	16.8	
15	9	47.4		July 2	12	59.1		16	14	53.8		Dec. 1	15	43.9	
17	4	17.9		4	7	28.2		18	9	20.0		3	10	11.2	
18	22	48.3		6	1	57.2		20	3	46.5		5	4	38.4	
20	17	18.9		7	20	26.2		21	22	12.7		6	23	5.9	
				9	14	55.0		23	16	38.9		8	17	33.4	
				11	9	24.0		25	11	5.0		10	12	1.1	
				13	3	52.7		27	5	31.3		12	6	28.6	
				14	22	21.5		28	23	57.4		14	0	56.4	
Apr. 29	19	7.2		16	16	50.1		30	18	23.4		15	19	24.2	
May 1	13	37.5		18	11	18.8		Oct. 2	12	49.4		17	13	52.1	
3	8	7.7													
				20	5	47.4		4	7	15.5		19	8	20.0	
5	2	38.0		22	0	15.9		6	1	41.5		21	2	48.0	
6	21	8.2		23	18	44.4		7	20	7.4		22	21	16.1	
8	15	38.4		25	13	12.9		9	14	33.3		24	15	44.4	
10	10	8.6		27	7	41.2		11	8	59.3		26	10	12.6	
12	4	38.7													
				29	2	9.4		13	3	25.3		28	4	41.0	
13	23	8.8		30	20	37.6		14	21	51.3		29	23	9.5	
15	17	39.0		Aug. 1	15	5.8		16	16	17.2		31	17	38.0	
17	12	9.0													



## WASHINGTON MEAN TIME OF SUPERIOR GEOCENTRIC CONJUNCTION.

## SATELLITE II.

		h m		h m		h m		h m			
Jan.	1	19 0.9	May	16	1 18.1	Aug.	2	6 54.1	Oct.	19	8 30.3
	5	8 22.7		19	14 42.4		5	20 9.3		22	21 36.7
	8	21 46.1		23	4 7.1		9	9 24.0		26	10 43.2
	12	11 9.2		26	17 31.8		12	22 38.1		29	23 50.0
	16	0 33.4		30	6 55.0		16	11 51.6	Nov.	2	12 57.0
	19	13 57.1	June	2	20 18.1		20	1 4.6		6	2 4.2
	23	3 22.1		6	9 41.6		23	14 16.9		9	15 11.9
	26	16 46.4		9	23 4.0		27	3 28.5		13	4 20.0
	30	6 12.0		13	12 26.7		30	16 39.7		16	17 28.5
Feb.	2	19 36.7		17	1 48.5	Sept.	3	5 50.2		20	6 37.5
	6	9 2.7		20	15 10.3		6	19 0.3		23	19 47.2
	9	22 28.0		24	4 31.3		10	8 9.9		27	8 57.3
	13	11 54.5		27	17 52.3		13	21 18.9		30	22 8.1
	17	1 20.0	July	1	7 12.6		17	10 27.5	Dec.	4	11 19.5
	20	14 46.8		4	20 32.6		20	23 35.6		8	0 31.5
				8	9 51.9		24	12 43.3		11	13 44.2
				11	23 11.0		28	1 50.6		15	2 57.5
Apr.	28	6 11.5		15	12 29.3	Oct.	1	14 57.6		18	16 11.5
May	1	19 37.6		19	1 47.4		5	4 4.4		22	5 26.0
	5	9 2.6		22	15 4.8		8	17 11.0		25	18 41.3
	8	22 28.3		26	4 21.7		12	6 17.4		29	7 57.2
	12	11 52.9		29	17 38.1		15	19 23.9			

## SATELLITE III.

		h m		h m		h m		h m			
Jan	2	22 9.3	May	18	11 7.2	Aug.	5	9 10.2	Oct.	22	23 20.7
	10	2 27.7		25	15 31.7		12	12 59.4		30	2 36.9
	17	6 48.2	June	1	19 54.3		19	16 43.2	Nov.	6	5 55.4
	24	11 11.4		9	0 15.4		26	20 22.3		13	9 16.5
	31	15 36.3		16	4 33.9	Sept.	2	23 56.7		20	12 41.1
Feb.	7	20 2.8		23	8 49.7		10	3 26.7		27	16 9.7
	15	0 31.1		30	13 1.9		17	6 52.8	Dec.	4	19 42.7
			July	7	17 11.0		24	10 14.9		11	23 21.4
				14	21 16.6	Oct.	1	13 33.6		19	3 5.1
May	4	2 13.4		22	1 18.5		8	16 50.4		26	6 54.8
	11	6 41.1		29	5 16.8		15	20 5.5			

## SATELLITE IV.

		h	m			h	m			h	m			h	m
Jan	13	18	36.6	May	10	20	10.8	Aug.	2	21	0.0	Oct.	25	1	28.5
	30	14	49.0		27	16	39.8		19	14	0.9	Nov.	10	15	45.9
Feb.	16	11	26.8	June	13	12	43.1	Sept.	5	6	1.0		27	6	44.4
					30	8	13.2		21	21	3.7	Dec.	13	22	41.8
				July	17	3	2.0	Oct.	8	11	26.4		30	15	43.5

WASHINGTON MEAN TIME.

JANUARY.

d	h	m	s	I.	Tr.	In.	d	h	m	s	I.	Tr.	In.	d	h	m	s	II.	Tr.	Eg.	
1	4	45		I.	Tr.	In.	10	22	34		I.	Tr.	In.	21	10	25		II.	Tr.	Eg.	
	6	0		I.	Sh.	In.	11	1	58	33	I.	Ec.	Re.		12	27		II.	Sh.	Eg.	
	7	3		I.	Tr.	Eg.		19	44		I.	Tr.	In.		13	35		I.	Tr.	Dis.	
	8	17		I.	Sh.	Eg.		20	54		I.	Sh.	In.		16	51	28	I.	Ec.	Re.	
	17	39		II.	Tr.	In.		22	2		I.	Tr.	Eg.		22	4	32	IV.	Tr.	In.	
	22	49	15	II.	Ec.	Re.		23	10		I.	Sh.	Eg.		8	6		IV.*	Tr.	Eg.	
2	2	5		I.	Tr.	In.	12	9	47		II.	Tr.	In.		10	45		I.	Tr.	In.	
	5	34	19	I.*	Ec.	Re.		14	46	14	II.	Ec.	Re.		11	48		I.	Sh.	In.	
	20	30		III.	Tr.	In.		17	4		I.	Tr.	Eg.		13	3		I.	Tr.	Eg.	
	23	14		I.	Sh.	In.		20	27	23	I.	Ec.	Re.		14	4		I.	Sh.	Eg.	
	23	48		III.	Tr.	In.	13	14	14		I.	Tr.	In.		15	6		IV.	Sh.	In.	
3	0	29		I.	Sh.	In.		14	59		III.	Tr.	In.		17	12		IV.	Sh.	Eg.	
	1	32		I.	Tr.	Eg.		15	23		I.	Sh.	In.		23	2	0	II.	Tr.	Dis.	
	1	45	35	III.	Ec.	Re.		16	32		I.	Tr.	Eg.		6	44	14	II.*	Ec.	Re.	
	2	46		I.	Sh.	Eg.		16	47		IV.	Tr.	In.		8	5		I.*	Tr.	Dis.	
	4	33	2	III.	Ec.	Re.		17	40		I.	Sh.	Eg.		11	20	16	I.	Ec.	Re.	
	12	48		II.	Tr.	In.		18	15		III.	Tr.	Eg.		5	16		I.	Tr.	In.	
	15	17		II.	Sh.	In.		19	43		III.	Sh.	In.		6	17		I.*	Sh.	In.	
	15	32		II.	Tr.	Eg.		20	46		IV.	Tr.	Eg.		7	34		I.*	Tr.	Eg.	
	17	56		II.	Sh.	Eg.		22	40		III.	Sh.	Eg.		8	33		I.	Sh.	Eg.	
	20	35		I.	Tr.	In.	14	4	21	33	IV.	Ec.	Re.		9	34		III.	Tr.	Dis.	
4	0	3	11	I.	Ec.	Re.		4	55		II.	Tr.	In.		12	48		III.	Tr.	Dis.	
	17	44		I.	Tr.	In.		6	10	53	IV.*	Ec.	Re.		13	54	13	III.	Ec.	Re.	
	18	58		I.	Sh.	In.		7	12		II.*	Sh.	In.		16	37	39	III.	Ec.	Re.	
	20	2		I.	Tr.	Eg.		7	39		II.*	Tr.	Eg.		21	5		II.	Tr.	In.	
	21	15		I.	Sh.	Eg.		9	50		II.	Sh.	Eg.		23	6		II.	Sh.	In.	
5	7	0		II.	Tr.	In.		11	34		I.	Tr.	Eg.		23	49		II.	Tr.	Eg.	
	8	28		IV.*	Tr.	In.		14	56	13	I.	Ec.	Re.		25	1	45	II.	Sh.	Eg.	
	12	7	58	II.	Ec.	Re.	15	8	45		I.	Tr.	In.		2	35		I.	Ec.	Re.	
	12	10		IV.	Tr.	Eg.		9	52		I.	Sh.	In.		5	49	4	I.*	Ec.	Re.	
	15	5		I.	Tr.	Eg.		11	2		I.	Tr.	Eg.		23	46		I.	Tr.	In.	
	18	32	1	I.	Ec.	Re.		12	8		I.	Sh.	Eg.		26	0	46	I.	Sh.	In.	
	20	40		IV.	Sh.	In.		23	11		II.	Tr.	Eg.		2	4		I.	Tr.	Eg.	
	23	3		IV.	Sh.	Eg.		4	5	51	II.	Ec.	Re.		3	2		I.	Sh.	Eg.	
6	10	39		III.	Tr.	In.		6	4		I.*	Ec.	Re.		15	25		II.	Tr.	Dis.	
	12	14		I.	Tr.	In.		9	25	1	I.	Ec.	Re.		20	2	57	II.	Ec.	Re.	
	13	27		I.	Sh.	In.	17	3	15		I.	Tr.	In.		21	5		I.	Ec.	Re.	
	13	56		III.	Tr.	Eg.		4	21		I.	Sh.	In.		27	0	17	50	I.	Ec.	Re.
	14	32		I.	Tr.	Eg.		5	10		III.	Tr.	Eg.		18	16		I.	Tr.	In.	
	15	41		III.	Sh.	In.		5	33		I.*	Tr.	Eg.		19	15		I.	Sh.	In.	
	15	44		I.	Sh.	Eg.		6	37		I.*	Sh.	Eg.		20	34		I.	Tr.	Eg.	
	18	39		III.	Sh.	Eg.		8	26		III.*	Ec.	Re.		21	31		I.	Sh.	Eg.	
7	2	10		II.	Tr.	In.		9	51	22	III.	Ec.	Dis.		23	46		III.	Tr.	In.	
	4	35		II.	Sh.	In.		12	36	10	III.	Ec.	Re.		28	3	0	III.	Tr.	Eg.	
	4	54		II.	Tr.	Eg.		18	18		II.	Tr.	In.		3	49		III.	Sh.	In.	
	7	14		II.*	Sh.	Eg.		20	30		II.	Sh.	In.		6	43		III.*	Sh.	Eg.	
	9	35		I.	Tr.	Eg.		21	2		II.	Tr.	Eg.		10	28		II.	Tr.	In.	
	13	0	53	I.	Ec.	Re.		23	9		II.	Sh.	Eg.		12	24		II.	Sh.	In.	
8	6	44		I.*	Tr.	In.	18	0	34		I.	Tr.	Eg.		13	12		II.	Tr.	Eg.	
	7	56		I.*	Sh.	In.		3	53	50	I.	Ec.	Re.		15	2		II.	Sh.	Eg.	
	9	2		I.*	Tr.	Eg.		21	45		I.	Tr.	In.		15	35		I.	Ec.	Re.	
	10	13		I.	Sh.	Eg.		22	50		I.	Sh.	In.		18	46	39	I.	Ec.	Re.	
	20	24		II.	Tr.	In.	19	0	3		I.	Tr.	Eg.		29	12	47	I.	Tr.	In.	
9	1	27	31	II.	Ec.	Re.		1	6		I.	Sh.	Eg.		13	44		I.	Sh.	In.	
	4	4		I.	Tr.	Eg.		12	35		II.	Tr.	Eg.		15	4		I.	Tr.	Eg.	
	7	29	43	I.*	Ec.	Re.		17	24	34	II.	Ec.	Re.		16	0		I.	Sh.	Eg.	
10	0	49		III.	Tr.	In.		19	4		I.	Tr.	Eg.		9	50	39	II.	Tr.	Dis.	
	1	14		I.	Sh.	In.		22	22	38	I.	Ec.	Re.		10	5		I.	Ec.	Re.	
	2	25		I.	Tr.	Eg.	20	16	15		I.	Tr.	In.		13	5		IV.	Tr.	Dis.	
	3	32		I.	Tr.	Eg.		17	19		I.	Sh.	In.		13	15	26	I.	Ec.	Re.	
	4	6		III.	Tr.	Eg.		18	33		I.	Tr.	Eg.		16	34		IV.	Tr.	Dis.	
	4	42		I.	Sh.	Eg.		19	21		III.	Tr.	In.		22	47	52	IV.	Ec.	Re.	
	5	48	44	III.*	Ec.	Re.		19	35		I.	Sh.	Eg.		0	15	35	IV.	Ec.	Re.	
	8	34	52	III.*	Ec.	Re.		22	36		III.	Tr.	Eg.		7	17		I.*	Tr.	In.	
	15	33		II.	Tr.	In.		23	46		III.	Sh.	In.		8	13		I.	Sh.	In.	
	17	53		II.	Sh.	In.	21	2	42		III.	Tr.	Eg.		9	35		I.	Tr.	Eg.	
	18	17		II.	Tr.	Eg.		7	41		III.	Sh.	In.		10	29		I.	Sh.	Eg.	
	20	32		II.	Sh.	Eg.		9	48		II.*	Tr.	In.		14	0		III.	Tr.	Dis.	
											II.	Sh.	In.		17	13		III.	Ec.	Re.	
															20	38	29	III.	Ec.	Re.	
															23	52		II.	Tr.	In.	

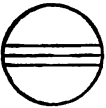
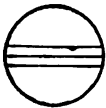
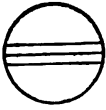
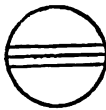
**NOTE.**—In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

Occ., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; \* Visible at Washington.

WASHINGTON MEAN TIME.

JANUARY.

*Phases of the Eclipses of the Satellites for an Inverting Telescope.*

I		r *
III.		d *      r *
II.		r *
IV.		d *      r *

*Configurations at 7<sup>h</sup> 30<sup>m</sup> for an Inverting Telescope.*

Day.	West.			East.		
1		'3	'2	I' ○		4'
2			'3	○	'I   '2	4'
3			I'	○	2' '3	4'
4			2'	○	'I   4'   '3	
5	○ 4'		'I	○		3'   '2 ●
6		4'		○	3' I'   2'	
7		4'	3'	2'' I ○		
8	○ I'   4'	'3	'2	○		
9	4'		'3	○	'I   '2	
10	'4		I'	○	2'	'3 ●
11	'4		2'	○	'I   '3	
12		'4	I'	'2 ○		3'
13			'4	○	3' I'   '2	
14			3'   'I	2' ○	'4	
15		3'   '2		○ I'		'4
16		'3		○	'2	'4   'I ●
17			I'	○	2'	'4 '3 ●
18		2'		○	'I   '3	4'
19			I' '2	○		3'   4'
20				○	I' 3' '2	4'
21	○ 2'		3'' I	○		4'
22		3'   '2	4' ○	I'		
23		'3 4'	'I ○	'2		
24	○ I'   4'		'3 ○		2'	
25	4'		2'	○	'I   '3	
26	4'		I' '2	○		3'
27	'4			○	'I   3' '2	
28		'4	'I 3'	○ 2'		
29		3' '4   2'		○ I'		
30		'3	I' '4 ○			'2 ●
31	○ I'		'3	○	'4 2'	

## WASHINGTON MEAN TIME.

## FEBRUARY.

d	h	m	s				d	h	m	s				d	h	m	s			
1	1	42		II.	Sh.	In.	8	1	7		IV.	Tr.	In.	14	14	20		I.	Sh.	Eg.
	2	36		II.	Tr.	Eg.		2	41		II.	Tr.	In.		22	57		III.	Oc.	Dis.
	4	20		II.	Sh.	Eg.		4	18		II.	Sh.	In.	15	4	39	52	III.	Ec.	Re.
	4	36		I.	Oc.	Dis.		4	27		IV.	Tr.	Eg.		5	30		II.	Tr.	In.
	7	44	12	I.*	Ec.	Re.		5	24		II.	Tr.	Eg.		6	54		II.*	Sh.	In.
2	1	48		I.	Tr.	In.		6	37		I.*	Oc.	Dis.		8	12		II.	Tr.	Eg.
	2	42		I.	Sh.	In.		6	56		II.*	Sh.	Eg.		8	39		I.	Oc.	Dis.
	4	5		I.	Tr.	Eg.		9	33		IV.	Sh.	In.		9	32		II.	Sh.	Eg.
	4	58		I.	Sh.	Eg.		9	39	16	I.	Ec.	Re.		11	34	15	I.	Ec.	Re.
	18	15		II.	Oc.	Dis.		11	19		IV.	Sh.	Eg.	16	5	52		I.	Tr.	In.
	22	41	22	II.	Ec.	Re.	9	3	50		I.	Tr.	In.		6	33		J.*	Sh.	In.
	23	6		I.	Oc.	Dis.		4	38		I.	Sh.	In.		8	9		I.	Tr.	Eg.
3	2	12	57	I.	Ec.	Re.		6	7		I.*	Tr.	Eg.		8	49		I.	Sh.	Eg.
	20	18		I.	Tr.	In.		6	54		I.*	Sh.	Eg.		9	51		IV.	Oc.	Dis.
	21	11		I.	Sh.	In.		21	7		II.	Oc.	Dis.		13	2		IV.	Oc.	Re.
	22	36		I.	Tr.	Eg.	10	1	7		I.	Oc.	Dis.		17	18	26	IV.	Ec.	Dis.
	23	27		I.	Sh.	Eg.		1	19	47	II.	Ec.	Re.		18	16	47	IV.	Ec.	Re.
4	4	14		III.	Tr.	In.		4	8	0	I.	Ec.	Re.		23	59		II.	Oc.	Dis.
	7	26		III.*	Tr.	Eg.		22	20		I.	Tr.	In.	17	3	9		I.	Oc.	Dis.
	7	52		III.*	Sh.	In.		23	6		I.	Sh.	In.		3	58	11	II.	Ec.	Re.
	10	45		III.	Sh.	Eg.	11	0	38		I.	Tr.	Eg.		6	2	58	I.	Ec.	Re.
	13	16		II.	Tr.	In.		1	22		I.	Sh.	Eg.	18	0	22		I.	Tr.	In.
	15	0		II.	Sh.	In.		8	43		III.	Tr.	In.		1	2		I.	Sh.	In.
	16	0		II.	Tr.	Eg.		11	53		III.	Tr.	Eg.		2	40		I.	Tr.	Eg.
	17	36		I.	Oc.	Dis.		11	55		III.	Sh.	In.		3	18		I.	Sh.	Eg.
	17	38		II.	Sh.	Eg.		14	47		III.	Sh.	Eg.		13	14		III.	Tr.	In.
	20	41	45	I.	Ec.	Re.		16	5		II.	Tr.	In.		15	58		III.	Sh.	In.
5	14	49		I.	Tr.	In.		17	36		II.	Sh.	In.		16	22		III.	Tr.	Eg.
	15	40		I.	Sh.	In.		18	48		II.	Tr.	Eg.		18	48		III.	Sh.	Eg.
	17	6		I.	Tr.	Eg.		19	38		I.	Oc.	Dis.		18	55		II.	Tr.	In.
	17	56		I.	Sh.	Eg.		20	14		II.	Sh.	Eg.		20	12		II.	Sh.	In.
6	7	41		II.*	Oc.	Dis.		22	36	47	I.	Ec.	Re.		21	37		II.	Tr.	Eg.
	12	1	6	II.	Ec.	Re.	12	16	51		I.	Tr.	In.		21	40		I.	Oc.	Dis.
	12	7		I.	Oc.	Dis.		17	35		I.	Sh.	In.		22	49		II.	Sh.	Eg.
	15	10	31	I.	Ec.	Re.		19	8		I.	Tr.	Eg.	19	0	31	43	I.	Ec.	Re.
7	9	19		I.	Tr.	In.		19	51		I.	Sh.	Eg.		18	53		I.	Tr.	In.
	10	9		I.	Sh.	In.	13	10	33		II.	Oc.	Dis.		19	31		I.	Sh.	In.
	11	37		I.	Tr.	Eg.		14	8		I.	Oc.	Dis.		21	10		I.	Tr.	Eg.
	12	25		I.	Sh.	Eg.		14	39	32	II.	Ec.	Re.		21	47		I.	Sh.	Eg.
	18	27		III.	Oc.	Dis.		17	5	31	I.	Ec.	Re.	20	13	26		II.	Oc.	Dis.
	21	38		III.	Oc.	Re.	14	11	21		I.	Tr.	In.		16	10		I.	Oc.	Dis.
	21	58	29	III.	Ec.	Dis.		12	4		I.	Sh.	In.		17	17	56	II.	Ec.	Re.
8	0	39	9	III.	Ec.	Re.		13	39		I.	Tr.	Eg.		19	0	26	I.	Ec.	Re.

## THE PHENOMENA OF THE SATELLITES OF JUPITER

ARE NOT GIVEN FROM FEBRUARY 21 TO APRIL 26,

JUPITER BEING TOO NEAR THE SUN.

NOTE.—In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; \* Visible at Washington.

## WASHINGTON MEAN TIME.

FEBRUARY.

*Phases of the Eclipses of the Satellites for an Inverting Telescope.*



*Configurations at 7<sup>h</sup> 0<sup>m</sup> for an Inverting Telescope.*

Day.	West.				East.			
1			2'	○		3	4	'1 ●
2			'2	1'	○		'3	4
3				○		'1	'2	3'
4	○ 3'			1'	○	2'		4'
5			3'	2'	○	1'		4'
6			'3		'1	'2	○	
7				3	○	1'	4'	2'
8				4'	○		3	
9			4'	'2	1'	○		'3
10		4'			○	'1	'2	3'
11	4'			1'	○	3'	2'	
12	'4		3'	2'	○		'1	
13	'4		'3		'1	'2	○	
14	'4			3	○	1'	'2	
15	○ 2'		'4		'1	○	3	
16	○ 1'			2	'4	○		3
17					○	'1	'2	4
18				1'	○	3'	2'	4
19			3'	2'	○		'1	
20		3'		'1	2	○		4
21					○			
22					○			
23					○			
24					○			
25					○			
26					○			
27					○			
28					○			
29					○			

## WASHINGTON MEAN TIME.

APRIL.

## THE PHENOMENA OF THE SATELLITES OF JUPITER

ARE NOT GIVEN FROM FEBRUARY 21 TO APRIL 26,

JUPITER BEING TOO NEAR THE SUN.

d	h	m	s				d	h	m	s				d	h	m	s			
27	1	46		I.	Sh.	In.	28	20	49		I.	Tr.	In.	30	8	21		III.	Sh.	In.
	2	18		I.	Tr.	In.		22	29		I.	Sh.	Eg.		10	45		III.	Tr.	In.
	4	1		I.	Sh.	Eg.		23	4		I.	Tr.	Eg.		10	59		III.	Sh.	Eg.
	4	33		I.	Tr.	Eg.	29	17	26	55	I.	Ec.	Dis.		13	23		III.	Tr.	Eg.
	22	58	23	I.	Ec.	Dis.		20	15		I.	Oc.	Re.		14	43		I.	Sh.	In.
28	1	44		I.	Oc.	Re.		22	5		II.	Sh.	In.		15	19		I.	Tr.	In.
	3	47	23	II.	Ec.	Dis.		23	15		II.	Tr.	In.		16	58		I.	Sh.	Eg.
	7	29		II.	Oc.	Re.	30	0	40		II.	Sh.	Eg.		17	34		I.	Tr.	Eg.
	20	14		I.	Sh.	In.		1	51		II.	Tr.	Eg.							

NOTE.—In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; \* Visible at Washington.

## WASHINGTON MEAN TIME.

APRIL.

*Phases of the Eclipses of the Satellites for an Inverting Telescope.*

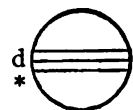
I.



III.



II.



IV. No Eclipse.



*Configurations at 17<sup>h</sup> 0<sup>m</sup> for an Inverting Telescope.*

Day.	West.	East.
1		○
2		○
3		○
4		○
5		○
6		○
7		○
8		○
9		○
10		○
11		○
12		○
13		○
14		○
15		○
16		○
17		○
18		○
19		○
20		○
21		○
22		○
23		○
24		○
25		○
26		○
27	'2 '1	'3 '4
28		1' '2 3' 4'
29	'1	2' 3' 4'
30	○ 1' 2' 3'	○ 4'

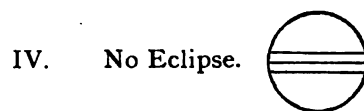
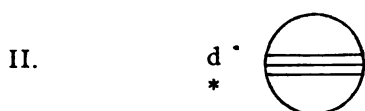
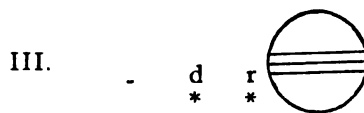
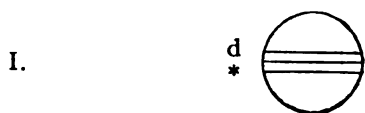
WASHINGTON MEAN TIME.																					
MAY.																					
d	h	m	s	I.	Ec.	Dis.	d	h	m	s	I.	Sh.	Eg.	d	h	m	s	I.	Tr.	In.	
1	11	55	31	I.	Oc.	Re.	11	7	50		III.	Oc.	Re.	21	21	22		I.	Sh.	Eg.	
	14	45		II.	Ec.	Dis.		7	57		I.	Tr.	Eg.		22	42		III.	Sh.	Eg.	
	17	6	37	II.	Oc.	Re.	12	2	46	48	I.	Ec.	Dis.		22	59		I.	Tr.	Eg.	
	20	55		I.	Sh.	In.		5	46		I.	Oc.	Re.	22	0	15		III.	Tr.	In.	
2	9	12						9	2	11	II.	Ec.	Dis.		2	40		III.	Tr.	Eg.	
	9	49		I.	Sh.	Eg.		13	10		II.	Oc.	Re.		17	38	2	I.	Ec.	Dis.	
	11	27		I.	Tr.	Eg.	13	0	4		I.	Sh.	In.		20	46		I.	Oc.	Re.	
	12	5		I.	Ec.	Dis.		0	51		I.	Tr.	In.	23	0	58	7	II.	Ec.	Dis.	
3	6	24	3	I.	Oc.	Re.		2	19		I.	Sh.	Eg.		5	24		II.	Oc.	Re.	
	9	15						3	6		I.	Tr.	Eg.		14	55		I.*	Sh.	In.	
	11	23		II.	Sh.	In.		21	15	19	I.	Ec.	Dis.		15	52		I.*	Tr.	In.	
	12	39		II.	Tr.	In.	14	0	16		I.	Oc.	Re.		17	10		I.	Sh.	Eg.	
	13	57		II.	Sh.	Eg.		3	16		II.	Sh.	In.		18	7		I.	Tr.	Eg.	
	15	15		III.	Ec.	Dis.		4	52		II.	Tr.	In.	24	12	6	32	I.	Ec.	Dis.	
	22	22	6					5	50		II.	Sh.	Eg.		15	16		I.*	Oc.	Re.	
4	0	45	23	III.	Oc.	Dis.		7	27		II.	Tr.	Eg.		19	9		II.	Sh.	In.	
	0	55		I.	Sh.	In.		16	25		III.*	Sh.	In.		21	4		II.	Tr.	In.	
	3	40		III.	Oc.	Re.		18	32		I.	Sh.	In.		21	43		II.	Sh.	Eg.	
	3	32		I.	Tr.	In.		18	58		III.	Sh.	Eg.		23	38		II.	Tr.	Eg.	
	4	20						19	22		I.	Tr.	In.	25	9	24		I.	Sh.	In.	
	5	55		I.	Tr.	Eg.		19	46		III.	Tr.	In.		10	22		I.	Tr.	In.	
	6	35		I.	Ec.	Dis.		20	47		I.	Sh.	Eg.		10	25	40	III.	Ec.	Dis.	
5	0	52	36	I.	Oc.	Re.		21	36		I.	Tr.	Eg.		11	39		I.	Sh.	Eg.	
	3	46		II.	Ec.	Dis.		22	16		III.	Tr.	Eg.		12	37		I.	Tr.	Eg.	
	6	24	52					15	15	43	54	I.*	Ec.	Dis.		12	44	25	III.	Ec.	Re.
	10	20		I.	Sh.	In.		18	46		I.	Oc.	Re.		14	20		III.	Oc.	Dis.	
	22	9		I.	Tr.	In.		22	21	9	II.	Ec.	Dis.		16	43		III.	Oc.	Re.	
	22	50		I.	Sh.	Eg.	16	2	35		II.	Oc.	Re.	26	6	35	3	I.	Ec.	Dis.	
6	0	24		I.	Tr.	Eg.		13	1		I.	Sh.	In.		9	46		I.	Oc.	Re.	
	1	5						13	52		I.	Tr.	In.		14	16	11	II.	Ec.	Dis.	
	19	21	9	I.	Oc.	Re.		15	16		I.*	Sh.	Eg.		18	48		II.	Oc.	Re.	
	22	16		II.	Sh.	In.		16	6		I.*	Tr.	Eg.	27	3	53		I.	Sh.	In.	
	0	40		II.	Tr.	In.	17	10	12	24	I.	Ec.	Dis.		4	52		I.	Tr.	In.	
	2	4		II.	Sh.	Eg.		13	16		I.	Oc.	Re.		6	7		I.	Sh.	Eg.	
	3	15						16	33		II.	Sh.	In.		7	7		I.	Tr.	Eg.	
	4	39		III.	Sh.	In.		18	17		II.	Tr.	In.	28	1	3	33	I.	Ec.	Dis.	
	12	23		III.	Sh.	Eg.		19	7		II.	Sh.	Eg.		4	16		I.	Oc.	Re.	
	14	58		III.	Tr.	In.		20	50		II.	Tr.	Eg.		8	27		II.	Sh.	In.	
	15	16		I.	Sh.	In.	18	6	24	25	III.	Ec.	Dis.		10	28		II.	Tr.	In.	
	16	38		I.	Tr.	In.		7	30		I.	Sh.	In.		11	0		II.	Sh.	Eg.	
	17	20		III.	Tr.	Eg.		8	22		I.	Tr.	In.		13	1		II.	Tr.	Eg.	
	17	50		I.	Sh.	Eg.		8	44	40	III.	Ec.	Re.		22	21		I.	Sh.	In.	
	18	52		I.	Tr.	Eg.		9	44		I.	Sh.	Eg.		23	22		I.	Tr.	In.	
	19	36		I.	Ec.	Dis.		9	53		III.	Oc.	Dis.								
8	13	49	44	I.	Oc.	Re.		10	37		I.	Tr.	Eg.	29	0	29		III.	Sh.	In.	
	16	46		II.	Ec.	Dis.		12	21		III.	Oc.	Re.		0	36		I.	Sh.	Eg.	
	19	43	59	II.	Oc.	Re.	19	4	40	57	I.	Ec.	Dis.		1	37		I.	Tr.	Eg.	
	23	46		I.	Sh.	In.		7	46		I.	Oc.	Re.		2	59		III.	Sh.	Eg.	
9	11	6		I.	Tr.	In.		11	39	17	II.	Ec.	Dis.		4	41		III.	Tr.	In.	
	11	51		I.	Sh.	Eg.		15	59		II.	Oc.	Re.		7	2		III.	Tr.	Eg.	
	13	21		I.	Tr.	Eg.	20	1	58		I.	Sh.	In.		19	32	7	I.	Ec.	Dis.	
	14	6		I.	Ec.	Dis.		2	52		I.	Tr.	In.		22	46		I.	Oc.	Re.	
10	8	18	15	I.	Oc.	Re.		4	13		I.	Sh.	Eg.	30	3	34	54	II.	Ec.	Dis.	
	11	16		II.	Sh.	In.		5	7		I.	Tr.	Eg.		8	11		II.	Oc.	Re.	
	13	58						23	9	27	I.	Ec.	Dis.		16	50		I.	Sh.	In.	
	15	28		II.	Tr.	In.	21	2	16		I.	Oc.	Re.		17	52		I.	Tr.	In.	
	16	32		II.	Sh.	Eg.		5	51		II.	Sh.	In.		19	4		I.	Sh.	Eg.	
	18	3		II.	Tr.	Eg.		7	41		II.	Tr.	In.		20	7		I.	Tr.	Eg.	
11	2	23	19	III.	Ec.	Dis.		8	25		II.	Sh.	Eg.	31	14	0	36	I.	Ec.	Dis.	
	4	45	6	III.	Ec.	Re.		10	14		II.	Tr.	Eg.		17	16		I.	Oc.	Re.	
	5	25		III.	Oc.	Dis.		20	14		I.	Sh.	In.		21	44		II.	Sh.	In.	
	5	35		I.	Sh.	In.		20	27		III.	Sh.	In.		23	51		II.	Tr.	In.	
	6	21		I.	Tr.	In.		20	27												



## WASHINGTON MEAN TIME.

MAY.

*Phases of the Eclipses of the Satellites for an Inverting Telescope.*



*Configurations at 16<sup>h</sup> 0<sup>m</sup> for an Inverting Telescope.*

Day.	West.		East.
1	3'	'2	'1 4'
2	'3	1' 4'	'2
3	4'	'3 2'	'1
4	4'	'2 1'	'3
5	4'		'2 3'
6	'4	'1	2' 3'
7	3' 4	2'	1'
8	'4 3'	'2	'1 ●
9	'3 4	1'	'2
10	2'	'3 4	'1
11		'2 1'	'3 4
12			'2 1' 3' 4
13		'1	2' 3' 4
14		2'	1' 4
15	3' 2'		4' 1 ●
16	1' 3		2 4'
17	'3	2' 1	4'
18	2' 1'	'3 4'	
19		4'	'1 3 2 ●
20	4'	'1	2' 3'
21	4'	2'	1' 3'
22	4'	3' 2' 1'	
23	1' 4 3'		'2
24	'4 3	'1 2'	
25	'4 2' 1'		'3 ●
26	'4	'1 3	'2 ●
27	1'	2' 3'	
28	2'	1' 3' 4	
29	'2 3' 1'		'4
30	3'	1' 2	'4
31	'3	2'	4' 1 ●

## WASHINGTON MEAN TIME.

## JUNE.

d	h	m	s				d	h	m	s				d	h	m	s				
1	0	18		II.	Sh.	Eg.	11	16	0		II.*	Tr.	In.	21	19	42	43	I.	Ec.	Dis.	
	2	24		II.	Tr.	Eg.		16	10		II.*	Sh.	Eg.		23	11		I.	Oc.	Re.	
	11	18		I.	Sh.	In.		18	31		II.	Tr.	Eg.	22	5	31		II.	Sh.	In.	
	12	22		I.	Tr.	In.	12	2	10		I.	Sh.	In.		8	4		II.	Sh.	Eg.	
	13	33		I.	Sh.	Eg.		3	21		I.	Tr.	In.		8	6		II.	Tr.	In.	
	14	26	58	III.	Ec.	Dis.		4	24		I.	Sh.	Eg.		10	36		II.	Tr.	Eg.	
	14	36		I.	Tr.	Eg.		5	35		I.	Tr.	Eg.		17	1		I.	Sh.	In.	
	16	44	12	III.	Ec.	Re.		8	31		III.	Sh.	In.		18	18		I.	Tr.	In.	
	18	45		III.	Oc.	Dis.		10	59		III.	Sh.	Eg.		19	15		I.	Sh.	Eg.	
	21	4		III.	Oc.	Re.		13	26		III.	Tr.	In.		20	32		I.	Tr.	Eg.	
2	8	29	8	I.	Ec.	Dis.		15	39		III.*	Tr.	Eg.	23	2	31	41	III.	Ec.	Dis.	
	11	45		I.	Oc.	Re.		23	20	13	I.	Ec.	Dis.		4	44	21	III.	Ec.	Re.	
	16	52	54	II.	Ec.	Dis.	13	2	43		I.	Oc.	Re.		7	46		III.	Oc.	Dis.	
	21	34		II.	Oc.	Re.		8	47	49	II.	Ec.	Dis.		9	53		III.	Oc.	Re.	
3	5	47		I.	Sh.	In.		13	42		II.	Oc.	Re.		14	11	15	I.*	Ec.	Dis.	
	6	52		I.	Tr.	In.		20	38		I.	Sh.	In.		17	40		I.	Oc.	Re.	
	8	2		I.	Sh.	Eg.		21	51		I.	Tr.	In.		0	41	47	II.	Ec.	Dis.	
	9	6		I.	Tr.	Eg.		22	53		I.	Sh.	Eg.		3	9	37	II.	Ec.	Re.	
4	2	57	37	I.	Ec.	Dis.		14	0	4	I.	Tr.	Eg.		3	16		II.	Oc.	Dis.	
	6	15		I.	Oc.	Re.		17	48	42	I.	Ec.	Dis.		5	46		II.	Oc.	Re.	
	11	2		II.	Sh.	In.		21	13		I.	Oc.	Re.		11	29		I.	Sh.	In.	
	13	14		II.	Tr.	In.		15	2	55	II.	Sh.	In.		12	48		I.	Tr.	In.	
	13	36		II.	Sh.	Eg.		5	22		II.	Tr.	In.		13	44		I.*	Sh.	Eg.	
	15	46		II.*	Tr.	Eg.		5	28		II.	Sh.	Eg.		15	1		I.*	Tr.	Eg.	
5	0	15		I.	Sh.	In.		7	53		II.	Tr.	Eg.	25	8	39	43	I.	Ec.	Dis.	
	1	22		I.	Tr.	In.		15	7		I.*	Sh.	In.		12	9		I.	Oc.	Re.	
	2	30		I.	Sh.	Eg.		16	20		I.	Tr.	In.		18	49		II.	Sh.	In.	
	3	36		I.	Tr.	Eg.		17	21		I.	Sh.	Eg.		21	22		II.	Sh.	Eg.	
	4	30		III.	Sh.	In.		18	34		I.	Tr.	Eg.		21	27		II.	Tr.	In.	
	6	59		III.	Sh.	Eg.		22	30	12	III.	Ec.	Dis.		23	57		II.	Tr.	Eg.	
	9	4		III.	Tr.	In.		16	0	44	24	III.	Ec.	Re.	26	5	58	I.	Sh.	In.	
	11	22		III.	Tr.	Eg.		3	28		III.	Oc.	Dis.		7	17		I.	Tr.	In.	
	21	26	10	I.	Ec.	Dis.		5	40		III.	Oc.	Re.		8	12		I.	Sh.	Eg.	
6	0	45		I.	Oc.	Re.		12	17	13	I.	Ec.	Dis.		9	30		I.	Tr.	Eg.	
	6	11	28	II.	Ec.	Dis.		15	42		I.*	Oc.	Re.		16	33		III.	Sh.	In.	
	10	57		II.	Oc.	Re.		22	5	41	II.	Ec.	Dis.		18	58		III.	Sh.	Eg.	
	18	44		I.	Sh.	In.		17	3	4	II.	Oc.	Re.		22	2		III.	Tr.	In.	
	19	52		I.	Tr.	In.		9	35		I.	Sh.	In.		0	6		III.	Tr.	Eg.	
	20	59		I.	Sh.	Eg.		10	50		I.	Tr.	In.	27	0	6		I.	Ec.	Dis.	
	22	6		I.	Tr.	Eg.		11	50		I.	Sh.	Eg.		3	8	16	I.	Oc.	Re.	
7	15	54	40	I.*	Ec.	Dis.		13	3		I.	Tr.	Eg.		6	38		I.	Ec.	Re.	
	19	14		I.	Oc.	Re.		18	6	45	41	I.	Ec.	Dis.		13	59	57	II.*	Ec.	Dis.
8	0	20		II.	Sh.	In.		10	12		I.	Oc.	Re.		16	27	37	II.	Ec.	Re.	
	2	37		II.	Tr.	In.		16	13		II.	Sh.	In.		16	38		II.	Oc.	Dis.	
	2	53		II.	Sh.	Eg.		18	44		II.	Tr.	In.		19	7		II.	Oc.	Re.	
	5	9		II.	Tr.	Eg.		18	46		II.	Sh.	Eg.	28	0	26		I.	Sh.	In.	
	13	13		I.	Sh.	In.		21	14		II.	Tr.	Eg.		1	46		I.	Tr.	In.	
	14	22		I.	Tr.	In.		19	4	4	I.	Sh.	In.		2	41		I.	Sh.	Eg.	
	15	27		I.*	Sh.	Eg.		5	19		I.	Tr.	In.		3	59		I.	Tr.	Eg.	
	16	35		I.	Tr.	Eg.		6	18		I.	Sh.	Eg.		21	36	44	I.	Ec.	Dis.	
	18	28	51	III.	Ec.	Dis.		7	33		I.	Tr.	Eg.	29	1	7		I.	Oc.	Re.	
	20	44	35	III.	Ec.	Re.		12	32		III.	Sh.	In.		8	7		II.	Sh.	In.	
	23	8		III.	Oc.	Dis.		14	58		III.*	Sh.	Eg.		10	40		II.	Sh.	Eg.	
9	1	23		III.	Oc.	Re.		17	45		III.	Tr.	In.		10	48		II.	Tr.	In.	
	10	23	11	I.	Ec.	Dis.		19	54		III.	Tr.	Eg.		13	18		II.*	Tr.	Eg.	
	13	44		I.	Oc.	Re.	20	1	14	15	I.	Ec.	Dis.		18	55		I.	Sh.	In.	
	19	29	26	II.	Ec.	Dis.		4	41		I.	Oc.	Re.		20	15		I.	Tr.	In.	
10	0	20		II.	Oc.	Re.		11	23	59	II.	Ec.	Dis.		21	9		I.	Sh.	Eg.	
	7	41		I.	Sh.	In.		13	51	58	II.*	Ec.	Re.		22	28		I.	Tr.	Eg.	
	8	51		I.	Tr.	In.		13	55		II.*	Oc.	Dis.	30	6	32	39	III.	Ec.	Dis.	
	9	56		I.	Sh.	Eg.		16	26		II.	Oc.	Re.		8	43	48	III.	Ec.	Re.	
	11	5		I.	Tr.	Eg.		22	32		I.	Sh.	In.		12	1		III.	Oc.	Dis.	
	11	4	51	39	I.	Ec.	Dis.	23	49		I.	Tr.	In.		14	3		III.*	Oc.	Re.	
	8	14		I.	Oc.	Re.	21	0	47		I.	Sh.	Eg.		16	5	16	I.	Ec.	Dis.	
	13	37		II.	Sh.	In.		2	2		I.	Tr.	Eg.		19	36		I.	Oc.	Re.	


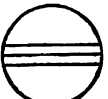


NOTE.—In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; \* Visible at Washington.

WASHINGTON MEAN TIME.

JUNE.

*Phases of the Eclipses of the Satellites for an Inverting Telescope.*

I.	d *		III.	d *      r *	
II.	d *		IV. No Eclipse.		

*Configurations at 15<sup>h</sup> 0<sup>m</sup> for an Inverting Telescope.*

Day.	West.			East.		
1		2°	1°		4°	3° ●
2			2°	1°	3°	4°
3			1°		2°	4° 3°
4	○ 2°				4° 1°	3°
5		2°	4° 1° 3°			
6		4° 2°			1° 2°	
7	4°	3°	1°		2°	
8	○ 1° 4°		2° 3°			
9	4°		2°	1°	3°	
10		4°	1°		2°	3°
11		4°		2°	1°	3°
12	○ 3°		2° 4° 1°			
13		3°		4° 1°		
14		3°	1°		2° 4°	
15			3° 2°	1°		4°
16			2°		3°	4° 1° ●
17			1°		2°	3° 4°
18				2° 1°	3°	4°
19		2°	1°		3°	4°
20		3°		1°	4°	2° ●
21		3°	1°		4°	2°
22			3° 4° 2°		1°	
23		4°	2°		3°	1° ●
24	4°			1°	2°	3°
25	4°				1° 2°	3°
26	4°		2° 1°		3°	
27		4°	3°		1°	2° ●
28		8° 4°	1°		2°	
29		3°	4° 2°		1°	
30		2°	1°		3° 4°	

WASHINGTON MEAN TIME.

JULY.

d	h	m	s					d	h	m	s					d	h	m	s					
1	3	17	42	II.	Ec.	Dis.		11	8	20		III.	Tr.	Eg.		21	21	47	24	I.	Ec.	Dis.		
	5	45	13	II.	Ec.	Re.			10	30		I.	Oc.	Re.		22	0	25		III.	Oc.	Dis.		
	5	58		II.	Oc.	Dis.			19	11	20	II.	Ec.	Dis.			1	22		I.	Oc.	Re.		
	8	27		II.	Oc.	Re.			21	38	26	II.	Ec.	Re.			2	12		III.	Oc.	Re.		
	13	23		I.*	Sh.	In.			21	57		II.	Oc.	Dis.			11	4	21	II.	Ec.	Dis.		
	14	44		I.*	Tr.	In.		12	0	25		II.	Oc.	Re.			13	31	3	II.*	Ec.	Re.		
	15	38		I.*	Sh.	Eg.			4	14		I.	Sh.	In.			13	51		II.*	Oc.	Dis.		
	16	57		I.	Tr.	Eg.			5	38		I.	Tr.	In.			16	18		II.*	Oc.	Re.		
2	10	33	44	I.	Ec.	Dis.			6	29		I.	Sh.	Eg.			19	5		I.	Sh.	In.		
	14	6		I.*	Oc.	Re.			7	51		I.	Tr.	Eg.			20	30		I.	Tr.	In.		
	21	25		II.	Sh.	In.		13	1	24	48	I.	Ec.	Dis.			21	19		I.	Sh.	Eg.		
	23	57		II.	Sh.	Eg.			4	59		I.	Oc.	Re.			22	42		I.	Tr.	Eg.		
3	0	9		II.	Tr.	In.			13	19		II.*	Sh.	In.		23	16	15	52	I.*	Ec.	Dis.		
	2	38		II.	Tr.	Eg.			15	51		II.*	Sh.	Eg.			19	50		I.	Oc.	Re.		
	7	52		I.	Sh.	In.			16	9		II.*	Tr.	In.		24	5	14		II.	Sh.	In.		
	9	14		I.	Tr.	In.			18	37		II.	Tr.	Eg.			7	45		II.	Sh.	Eg.		
	10	6		I.	Sh.	Eg.			22	43		I.	Sh.	In.			8	5		II.	Tr.	In.		
	11	26		I.	Tr.	Eg.		14	0	7		I.	Tr.	In.			10	32		II.	Tr.	Eg.		
	20	35		III.	Sh.	In.			0	57		I.	Sh.	Eg.			13	34		I.*	Sh.	In.		
	22	59		III.	Sh.	Eg.			2	20		I.	Tr.	Eg.			14	58		I.*	Tr.	In.		
4	2	16		III.	Tr.	In.			14	34	41	III.*	Ec.	Dis.			15	48		I.*	Sh.	Eg.		
	4	15		III.	Tr.	Eg.			16	42	46	III.	Ec.	Re.			17	10		I.	Tr.	Eg.		
	5	2	17	I.	Ec.	Dis.			19	53	20	I.	Ec.	Dis.		25	8	39		III.	Sh.	In.		
	8	35		I.	Oc.	Re.			20	21		III.	Oc.	Dis.			10	44	27	I.	Ec.	Dis.		
	16	35	44	II.	Ec.	Dis.			22	13		III.	Oc.	Re.			10	58		III.	Sh.	Eg.		
	19	3	7	II.	Ec.	Re.			23	28		I.	Oc.	Re.			14	19		I.*	Oc.	Re.		
	19	18		II.	Oc.	Dis.		15	8	28	57	II.	Ec.	Dis.			14	34		III.*	Tr.	In.		
	21	47		II.	Oc.	Re.			10	55	55	II.	Ec.	Re.			16	19		III.*	Tr.	Eg.		
5	2	20		I.	Sh.	In.			11	15		II.	Oc.	Dis.		26	0	22	3	II.	Ec.	Dis.		
	3	42		I.	Tr.	In.			13	43		II.*	Oc.	Re.			2	48	37	II.	Ec.	Re.		
	4	35		I.	Sh.	Eg.			17	11		I.	Sh.	In.			3	8		II.	Oc.	Dis.		
	5	55		I.	Tr.	Eg.			18	36		I.	Tr.	In.			5	35		II.	Oc.	Re.		
	23	30	46	I.	Ec.	Dis.			19	25		I.	Sh.	Eg.			8	2		I.	Sh.	In.		
6	3	4		I.	Oc.	Re.			20	48		I.	Tr.	Eg.			9	27		I.	Tr.	In.		
	10	43		II.	Sh.	In.		16	14	21	48	I.*	Ec.	Dis.			10	16		I.	Sh.	Eg.		
	13	15		II.*	Sh.	Eg.			17	56		I.	Oc.	Re.			11	39		I.*	Tr.	Eg.		
	13	30		II.*	Tr.	In.			17	2	37	II.	Sh.	In.		27	5	12	57	I.	Ec.	Dis.		
	15	58		II.*	Tr.	Eg.			5	9		II.	Sh.	Eg.			8	47		I.	Oc.	Re.		
	20	49		I.	Sh.	In.			5	28		II.	Tr.	In.			18	32		II.	Sh.	In.		
	22	12		I.	Tr.	In.			7	56		II.	Tr.	Eg.			21	4		II.	Sh.	Eg.		
	23	3		I.	Sh.	Eg.			11	40		I.	Sh.	In.			21	23		II.	Tr.	In.		
7	0	24		I.	Tr.	Eg.			13	5		I.*	Tr.	In.			23	50		II.	Tr.	Eg.		
	10	33	32	III.	Ec.	Dis.			13	54		I.*	Sh.	Eg.		28	2	31		I.	Sh.	In.		
	12	43	10	III.	Ec.	Re.			15	17		I.*	Tr.	Eg.			3	55		I.	Tr.	In.		
	16	13		III.*	Oc.	Dis.			18	4	38	III.	Sh.	In.			4	45		I.	Sh.	Eg.		
	17	59	18	I.	Ec.	Dis.			6	58		III.	Sh.	Eg.			6	7		I.	Tr.	Eg.		
	18	9		III.	Oc.	Re.			8	50	22	I.	Ec.	Dis.			22	37	45	III.	Ec.	Dis.		
	21	33		I.	Oc.	Re.			10	32		III.	Tr.	In.			23	41	30	I.	Ec.	Dis.		
8	5	53	25	II.	Ec.	Dis.			12	22		III.*	Tr.	Eg.		29	0	42	46	III.	Ec.	Re.		
	8	20	39	II.	Ec.	Re.			12	25		I.*	Oc.	Re.			3	15		I.	Oc.	Re.		
	8	38		II.	Oc.	Dis.			21	46	46	II.	Ec.	Dis.			4	26		III.	Oc.	Dis.		
	11	6		II.	Oc.	Re.			19	0	13	36	II.	Ec.	Re.			6	8		III.	Oc.	Re.	
	15	18		I.*	Sh.	In.			0	34		II.	Oc.	Dis.			13	39	35	II.*	Ec.	Dis.		
	16	40		I.	Tr.	In.			3	1		II.	Oc.	Re.			16	6	2	II.*	Ec.	Re.		
	17	32		I.	Sh.	Eg.			6	8		I.	Sh.	In.			16	25		II.*	Oc.	Dis.		
	18	53		I.	Tr.	Eg.			7	33		I.	Tr.	In.			18	51		II.	Oc.	Re.		
9	12	27	45	I.	Ec.	Dis.			8	22		I.	Sh.	Eg.			20	59		I.	Sh.	In.		
	16	1		I.	Oc.	Re.			9	46		I.	Tr.	Eg.			22	23		I.	Tr.	In.		
10	0	1		II.	Sh.	In.			3	18	51	I.	Ec.	Dis.			23	13		I.	Sh.	Eg.		
	2	33		II.	Sh.	Eg.			6	54		I.	Oc.	Re.		30	0	35		I.	Tr.	Eg.		
	2	50		II.	Tr.	In.			15	55		II.*	Sh.	In.			18	9	58	I.	Ec.	Dis.		
	5	18		II.	Tr.	Eg.			18	27		II.	Sh.	Eg.			21	44		I.	Oc.	Re.		
	-9	46		I.	Sh.	In.			18	47		II.	Tr.	In.		31	7	50		II.	Sh.	In.		
	11	10		I.	Tr.	In.			21	14		II.	Tr.	Eg.			10	22		II.	Sh.	Eg.		
	12	0		I.	Sh.	Eg.		21	0	37		I.	Sh.	In.			10	40		II.	Tr.	In.		
	13	22		I.*	Tr.	Eg.			2	2		I.	Tr.	In.			13	7		II.*	Tr.	Eg.		
11	0	37		III.	Sh.	In.			2	51		I.	Sh.	Eg.			15	27		I.*	Sh.	In.		
	2	58		III.	Sh.	Eg.			4	14		I.	Tr.	Eg.			16	51		I.	Tr.	In.		
	6	26		III.	Tr.	In.			18	35	53	III.	Ec.	Dis.			17	42		I.	Sh.	Eg.		
	6	56	19	I.	Ec.	Dis.			20	42	26	III.	Ec.	Re.			19	3		I.	Tr.	Eg.		

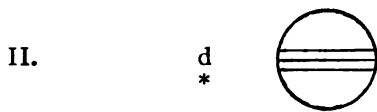
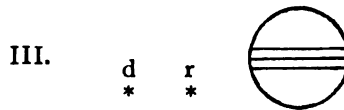
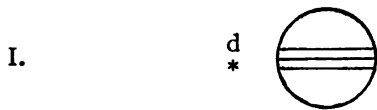
NOTE.—In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; \* Visible at Washington.

WASHINGTON MEAN TIME.

JULY.

*Phases of the Eclipses of the Satellites for an Inverting Telescope.*



*Configurations at 14<sup>h</sup> 0<sup>m</sup> for an Inverting Telescope.*

Day.	West.				East.			
1					○ 1' 2' 3' 4'			
2					○ 2' 3' 4' 1' ●			
3		2' 1'			○ 3' 4'			
4		3' 2'			○ 1' 4'			
5		3' 1'			○ 2' 4'			
6	○ 2'	3'			○ 1' 4'			
7		2' 1' 3'			○ 4'			
8					○ 4' 1' 2' 3'			
9		4'			○ 2' 3' 1' ●			
10		4' 2' 1'			○ 3'			
11	4'	2' 3'			○ 1'			
12	4' 3' 1'				○ 2'			
13	4' 3'				○ 2' 1'			
14	4' 2' 1' 3'				○			
15	4' 2' 1' 3'				○ 2' 1' 3'			
16	4' 1' 2' 3'				○ 2' 3'			
17	○ 1' 2' 3' 4'				○ 4' 3'			
18	2' 3' 1' 4'				○ 1' 4'			
19	3' 1' 2' 4'				○ 2' 4'			
20	3' 2' 1' 4'				○ 2' 1' 4'			
21	2' 1' 3' 4'				○ 4'			
22					○ 1' 3' 4' 2' ●			
23		1' 2' 3' 4'			○ 2' 3' 4'			
24		2' 1' 3' 4'			○ 1' 4' 3'			
25	○ 3' 2' 1' 4'				○ 1' ●			
26	4' 3' 1' 2'				○ 2'			
27	4' 3' 2' 1'				○ 2' 1'			
28	4' 2' 3' 1'				○			
29	4' 1' 2' 3'				○ 1' 3' 2' ●			
30	4' 1' 2' 3'				○ 2' 3'			
31	4' 2' 1' 3'				○ 1' 3'			

## WASHINGTON MEAN TIME.

## AUGUST.

d	h	m	s		d	h	m	s		d	h	m	s		d	h	m	s		
1	12	38	34	I.*	Ec.	Dis.				21	15	41			II.*	Sh.	In.			
	12	40		III.*	Sh.	In.					18	12			II.	Tr.	In.			
	14	57		III.*	Sh.	Eg.					18	12			II.	Sh.	Eg.			
	16	12		I.*	Oc.	Re.					20	37			II.	Tr.	Eg.			
	18	31		III.	Tr.	In.					21	9			I.	Sh.	In.			
	20	12		III.	Tr.	Eg.					22	23			I.	Tr.	In.			
2	2	57	12	II.	Ec.	Dis.					23	23			I.	Sh.	Eg.			
	5	23	31	II.	Ec.	Re.					22	0	34		I.	Tr.	Eg.			
	5	41		II.	Oc.	Dis.					18	21	14		I.	Ec.	Dis.			
	8	7		II.	Oc.	Re.					21	44			I.	Oc.	Re.			
	9	56		I.	Sh.	In.					23	0	44		III.	Sh.	In.			
	11	19		I.*	Tr.	In.						2	57		III.	Sh.	Eg.			
	12	10		I.*	Sh.	Eg.						5	58		III.	Tr.	In.			
	13	31		I.*	Tr.	Eg.						7	24		III.	Tr.	Eg.			
3	7	7	4	I.	Ec.	Dis.						10	42	3	II.*	Ec.	Dis.			
	10	40		I.	Oc.	Re.						15	29		II.*	Oc.	Re.			
	21	8		II.	Sh.	In.						15	38		I.*	Sh.	In.			
	23	40		II.	Sh.	Eg.						16	50		I.*	Tr.	In.			
	23	57		II.	Tr.	In.						17	51		I.	Sh.	Eg.			
4	2	23		II.	Tr.	Eg.						19	2		I.	Tr.	Eg.			
	4	24		I.	Sh.	In.						24	12	49	46	I.*	Ec.	Dis.		
	5	47		I.	Tr.	In.						16	11		I.	Oc.	Re.			
	6	38		I.	Sh.	Eg.						4	59		II.	Sh.	In.			
	7	59		I.	Tr.	Eg.						7	26		II.	Tr.	In.			
5	1	35	39	I.	Ec.	Dis.						7	30		II.	Sh.	Eg.			
	2	39	5	III.	Ec.	Dis.						9	50		II.*	Tr.	Eg.			
	4	42	36	III.	Ec.	Re.						10	6		I.*	Sh.	In.			
	5	8		I.	Oc.	Re.						11	17		I.*	Tr.	In.			
	8	22		III.	Oc.	Dis.						12	20		I.*	Sh.	Eg.			
	9	59		III.	Oc.	Re.						13	29		I.*	Tr.	Eg.			
	16	14	42	II.*	Ec.	Dis.						26	7	18	24	I.	Ec.	Dis.		
	18	40	53	II.	Ec.	Re.						10	38		I.*	Oc.	Re.			
	18	56		II.	Oc.	Dis.						14	42	46	III.*	Ec.	Dis.			
	21	22		II.	Oc.	Re.						16	41	45	III.*	Ec.	Re.			
	22	53		I.	Sh.	In.						19	40		III.	Oc.	Dis.			
6	0	15		I.	Tr.	In.						21	5		III.	Oc.	Re.			
	1	7		I.	Sh.	Eg.						23	59	28	II.	Ec.	Dis.			
	2	27		I.	Tr.	Eg.						4	35		I.	Sh.	In.			
	20	4		I.	Ec.	Dis.						4	41		II.	Oc.	Re.			
	23	36		I.	Oc.	Re.						5	44		I.	Tr.	In.			
7	10	27		II.	Sh.	In.						6	48		I.	Sh.	Eg.			
	12	58		II.*	Sh.	Eg.						7	56		I.	Tr.	Eg.			
	13	13		II.*	Tr.	In.						14	42	56	I.	Ec.	Dis.			
	15	39		II.*	Tr.	Eg.						5	5		I.	Oc.	Re.			
	17	21		I.	Sh.	In.						18	18		II.	Sh.	In.			
	18	43		I.	Tr.	In.						20	39		II.	Tr.	In.			
	19	35		I.	Sh.	Eg.						20	49		II.	Sh.	Eg.			
	20	55		I.	Tr.	Eg.						23	3		II.	Tr.	Eg.			
8	14	32	44	I.*	Ec.	Dis.						23	3		I.	Sh.	In.			
	16	41		III.*	Sh.	In.						29	0	11	I.	Tr.	In.			
	18	4		I.	Oc.	Re.						1	17		I.	Sh.	Eg.			
	18	57		III.	Sh.	Eg.						2	23		I.	Tr.	Eg.			
	22	25		III.	Tr.	In.						20	15	35	I.	Ec.	Dis.			
9	0	0		III.	Tr.	Eg.						23	32		I.	Oc.	Re.			
	5	32	15	II.	Ec.	Dis.						4	45		III.	Sh.	In.			
	7	58	19	II.	Ec.	Re.						6	57		III.	Sh.	Eg.			
	8	12		II.	Oc.	Dis.						9	36		III.*	Tr.	In.			
	10	37		II.*	Oc.	Re.						11	0		III.*	Tr.	Eg.			
	11	50		I.*	Sh.	In.						13	16	54	II.*	Ec.	Dis.			
	13	11		I.*	Tr.	In.						17	32		I.	Sh.	In.			
	14	4		I.*	Sh.	Eg.						17	52		II.	Oc.	Re.			
	15	23		I.*	Tr.	Eg.						18	38		I.	Tr.	In.			
10	9	1	14	I.	Ec.	Dis.						19	45		I.	Sh.	Eg.			
	12	31		I.*	Oc.	Re.						20	50		I.	Tr.	Eg.			
	23	45		II.	Sh.	In.						31	14	44	9	I.*	Ec.	Dis.		
11	2	17		II.	Sh.	Eg.						17	59		I.	Oc.	Re.			
	2	29		II.	Tr.	In.														
	4	54		II.	Tr.	Eg.														



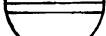
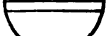
NOTE.—In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; \* Visible at Washington.

WASHINGTON MEAN TIME.

AUGUST.

*Phases of the Eclipses of the Satellites for an Inverting Telescope.*

<p>I.                      d      </p> <p>                             *</p>	<p>III.                      </p> <p>                             d      r</p> <p>                             *      *</p>
<p>II.                      d      </p> <p>                             *</p>	<p>IV.      No Eclipse.      </p>

*Configurations at 13<sup>h</sup> 30<sup>m</sup> for an Inverting Telescope.*

Day.	West.	East.
1	'4 '2	○ 3' '1 ●
2	○ 1' 3' '4	○ '2
3	3' '3 2' 1'	○ '1 '4 2'
4	'3 2' 1'	○ '4
5	'2	○ '3 '1 '4
6	'1	○ '2 '3 '4
7	○ 2' '2 '1	○ 1' 3' 4'
8	'2 '1	○ 3' 4'
9	○ 1' 3'	○ '2 4'
10	3'	○ '1 4' 2'
11	'3 2' 4' 1'	○
12	4' '2	○ '1 '3 ●
13	4' 1'	○ '2 '3
14	4' 2' '1	○ 2' 1' 3'
15	'4 2' '1	○ 3'
16	'4 3'	○ 1' 2'
17	'4 3' '3 '4 2' 1'	○ '1 ●
18	'3 '4 2' 1'	○
19	'2 '3	○ '1 '4
20	1'	○ '2 '4 3'
21		○ 2' 1' 3' '4
22	2' '1	○ 3' '4
23	3'	○ 1' '4 '2 ●
24	3' 2' 1'	○ 2' 4' '1 ●
25	'3 2' 1'	○ 4'
26	'2 '3	○ '1 4'
27	1'	○ 4' '2 '3
28	4'	○ 2' '1 '3
29	4' 2' '1	○ 3'
30	4' 3'	○ 1' '2 ●
31	4' 3' '1	○ '2

## WASHINGTON MEAN TIME.

## SEPTEMBER.

d	h	m	s		d	h	m	s		d	h	m	s		d	h	m	s	
1	7	37		II.	10	10	36		I.*	20	21	20		III.	21	20			
	9	51		II.*		11	30		I.*		23	13		I.		23			
	10	8		II.*	11	5	35	53	I.		23	56		I.		23			
	12	0		I.*		8	40		I.*	21	0	47		II.		0			
	12	15		II.*		23	33		II.		1	27		I.		1			
	13	5		I.*	12	1	24		II.		2	7		I.		2			
	14	14		I.*		2	4		II.		20	27	53	I.		20			
	15	16		I.*		2	51		I.		23	18		I.		23			
2	9	12	48	I.*		3	48		II.	22	15	30		II.*		15			
	12	26		I.*		3	45		I.		16	53		II.*		16			
	18	44	13	III.		5	4		I.		17	42		I.		17			
	20	41	42	III.		5	56		I.		18	0		II.		18			
	23	16		III.	13	0	4	35	I.		18	22		I.		18			
3	0	38		III.		3	6		I.		19	16		II.		19			
	2	34	17	II.		12	47		III.*		19	55		I.		19			
	6	28		I.		14	57		III.*		20	33		I.		20			
	7	2		II.		16	37		III.*	23	14	56	37	I.*		14			
	7	32		I.		17	57		III.		17	44		I.		17			
	8	42		I.		18	26	28	II.		24	6	49	55	III.		6		
	9	43		I.*		21	19		I.		8	42	57	III.*		8			
4	3	41	21	I.		22	11		I.		9	35		III.*		9			
	6	53		I.		22	31		II.		10	18	46	II.*		10			
	20	55		II.		23	33		I.		10	55		III.*		10			
	23	3		II.	14	0	22		I.		12	10		I.*		12			
	23	26		II.		18	33	12	I.		12	48		I.*		12			
	5	0	57	I.		21	33		I.		13	55		II.*		13			
	1	26		II.	15	12	52		II.*		14	24		I.*		14			
	1	59		I.		14	34		II.*		14	59		I.*		14			
	3	10		I.		15	22		II.*		25	9	25	14	I.*		9		
	4	10		I.		15	48		I.*		12	11		I.*		12			
	22	10	2	I.		16	37		I.*		26	4	48	II.		4			
6	1	20		I.		16	58		II.*		6	2		II.		6			
	8	46		III.*		18	1		I.		6	39		I.		6			
	10	57		III.*		18	49		I.		7	14		I.		7			
	13	10		III.*	16	13	1	54	I.*		7	19		II.		7			
	14	30		III.*		15	59		I.*		8	25		II.*		8			
	15	51	40	II.*	17	2	48	5	III.		8	52		I.*		8			
	19	25		I.		4	42	36	III.		9	25		I.*		9			
	20	12		II.		6	13		III.		27	3	54	0	I.		3		
	20	25		I.		7	32		III.		6	37		I.		6			
	21	39		I.		7	43	54	II.		20	48		III.		20			
	22	36		I.		10	16		I.*		22	56		III.		22			
7	16	38	37	I.*		11	4		I.*		23	20		III.		23			
	19	47		I.		11	39		II.*		23	36	12	II.		23			
8	10	14		II.*		12	30		I.*		28	0	40	III.		28			
	12	14		II.*		13	15		I.*		1	8		I.		1			
	12	45		II.*	18	7	30	30	I.		1	40		I.		1			
	13	54		I.*		10	26		I.*		3	2		II.		3			
	14	37		II.*	19	2	11		II.		3	21		I.		3			
	14	52		I.*		3	44		II.		3	51		I.		3			
	16	7		I.*		4	41		II.		22	22	40	I.		22			
	17	3		I.*		4	45		I.		29	1	3	I.		29			
9	11	7	18	I.*		5	30		I.		18	7		II.		18			
	14	13		I.*		6	7		II.		19	10		II.		19			
	22	45	47	III.		6	58		I.		19	36		I.		19			
10	0	41	46	III.		7	41		I.		20	6		I.		20			
	2	47		III.	20	1	59	14	I.		20	38		II.		20			
	4	6		III.		4	52		I.		21	33		II.		21			
	5	9	5	II.		16	48		III.*		21	49		I.		21			
	8	22		I.*		18	56		III.		22	17		I.		22			
	9	18		I.*		20	0		III.		30	16	51	26	I.		30		
	9	22		II.*		21	1	19	II.		19	29		I.		19			

NOTE.—In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

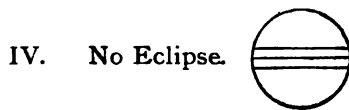
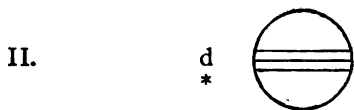
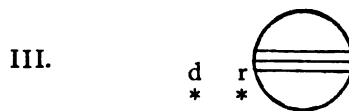
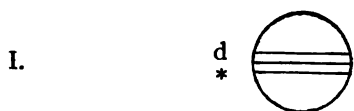
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; \* Visible at Washington.



WASHINGTON MEAN TIME.

SEPTEMBER.

*Phases of the Eclipses of the Satellites for an Inverting Telescope.*



*Configurations at 12<sup>h</sup> 30<sup>m</sup> for an Inverting Telescope.*

Day.	West.			East.		
1	○ 2' 4'		'3	○ 1'		
2		'4	'2 '3	○		'1 ●
3		'4	1'	○ '2 '3		
4			'4	○ '1 2' '3		
5			2' 1'	○ '4 3'		
6	○ 3'		'2	○ 1' '4		
7		3'	'1	○ '2 '4		
8	○ 2'	'3		○ 1' '4		
9		'2 '3		○		4' '1 ●
10			1'	○ '2 '3 4'		
11				○ '1 2' '3 4'		
12		2' 1'		○ 4' 3'		
13		'2		○ 3' '1		
14		4' 3'	'1	○ '2		
15	4' '3		2' 1'	○ 2' 1'		
16	4'	2' 3'	'1	○		
17	○ 1' 4'			○ '2 '3		
18	'4		2' 1'	○ '1 2' '3		
19	'4		'2	○ 3' '1 3'		
20		'4	'2	○ 3' '1 '2		
21		3' '1 '4		○ 2' 1' '4		
22		3'		○ '2 '1' '4		
23		'3 2'	'1	○ '4		
24				○ 1' 3' '4 '2 ●		
25				○ '1 2' '3 '4		
26		2' 1'		○ 3' '4		
27		'2		○ 3' '1 4'		
28		3' 1'		○ '2 4'		
29		3'		○ 2' 4' '1		
30		'3 2' '1		○		

## WASHINGTON MEAN TIME.

## OCTOBER.

d	h	m	s				d	h	m	s				d	h	m	s			
1	10	51	57	III.*	Ec.	Dis.	11	10	5		I.*	Oc.	Re.	21	22	29		I.	Oc.	Dis.
12	43	33		III.*	Ec.	Re.	12	4	46	15	II.	Ec.	Dis.	22	0	45	27	I.	Ec.	Re.
12	53			III.*	Oc.	Dis.		4	53		III.	Sh.	In.		19	41		I.	Tr.	In.
12	53	41		II.*	Ec.	Dis.		4	56		I.	Sh.	In.		19	48		I.	Sh.	In.
14	5			I.*	Sh.	In.		5	7		I.	Tr.	In.		20	25		II.	Oc.	Dis.
14	14			III.*	Oc.	Re.		5	51		III.	Tr.	In.		21	53		I.	Tr.	Eg.
14	32			I.*	Tr.	In.		6	58		III.*	Sh.	Eg.		22	1		I.	Sh.	Eg.
16	9			II.*	Oc.	Re.		7	9		I.*	Sh.	Eg.		22	35		III.	Oc.	Dis.
16	18			I.*	Sh.	Eg.		7	17		III.*	Tr.	Eg.		23	3	28	II.	Ec.	Re.
16	43			I.*	Tr.	Eg.		7	18		I.*	Tr.	Eg.	23	0	44	58	III.	Ec.	Re.
2	11	20	5	I.*	Ec.	Dis.		7	29		II.*	Oc.	Re.		16	55		I.*	Oc.	Dis.
13	55			I.*	Oc.	Re.	13	2	12	37	I.	Ec.	Dis.		19	14	11	I.	Ec.	Re.
3	7	26		II.*	Sh.	In.		4	31		I.	Oc.	Re.	24	14	7		I.*	Tr.	In.
8	18			II.*	Tr.	In.		23	24		II.	Sh.	In.		14	16		I.*	Sh.	In.
8	33			I.*	Sh.	In.		23	25		I.	Sh.	In.		15	3		II.*	Tr.	In.
8	58			I.*	Tr.	In.		23	32		I.	Tr.	In.		15	21		II.*	Sh.	In.
9	57			II.*	Sh.	Eg.		23	41		II.	Tr.	In.		16	19		I.*	Tr.	Eg.
10	41			II.*	Tr.	Eg.	14	1	38		I.	Sh.	Eg.		16	30		I.*	Sh.	Eg.
10	46			I.*	Sh.	Eg.		1	44		I.	Tr.	Eg.		17	27		II.	Tr.	Eg.
11	9			I.*	Tr.	Eg.		1	54		II.	Sh.	Eg.		17	51		II.	Sh.	Eg.
4	5	48	53	I.	Ec.	Dis.		2	4		II.	Tr.	Eg.	25	11	21		I.*	Oc.	Dis.
8	21			I.*	Oc.	Re.		20	41	28	I.	Ec.	Dis.		13	43	2	I.*	Ec.	Re.
5	0	51		III.	Sh.	In.		22	57		I.	Oc.	Re.	26	8	33		I.*	Tr.	In.
2	11	10		II.	Ec.	Dis.	15	17	53		I.	Sh.	In.		8	45		I.*	Sh.	In.
2	36			III.	Tr.	In.		17	58		I.	Tr.	In.		9	31		II.*	Oc.	Dis.
2	57			III.	Sh.	Eg.		18	3	49	II.	Ec.	Dis.		10	44		I.*	Tr.	Eg.
3	2			I.	Sh.	In.		18	55	26	III.	Ec.	Dis.		10	58		I.*	Sh.	Eg.
3	24			I.	Tr.	In.		20	6		I.	Sh.	Eg.		12	18		III.*	Tr.	In.
3	58			III.	Tr.	Eg.		20	10		I.	Tr.	Eg.		12	21	7	II.*	Ec.	Re.
5	15			I.	Sh.	Eg.		20	36		II.	Oc.	Re.		12	57		III.*	Sh.	In.
5	16			II.	Oc.	Re.		20	49		III.	Oc.	Re.		13	51		III.*	Tr.	Eg.
5	35			I.	Tr.	Eg.	16	15	10	10	I.*	Ec.	Dis.		14	58		III.*	Sh.	Eg.
6	0	17	35	I.	Ec.	Dis.		17	23		I.	Oc.	Re.	27	5	47		I.*	Oc.	Dis.
2	47			I.	Oc.	Re.	17	12	22		I.*	Sh.	In.		8	11	49	I.*	Ec.	Re.
20	46			II.	Sh.	In.		12	24		I.*	Tr.	In.	28	2	59		I.	Tr.	In.
21	26			II.	Tr.	In.		12	43		II.*	Sh.	In.		3	14		I.	Sh.	In.
21	30			I.	Sh.	In.		12	48		II.*	Tr.	In.		4	11		II.	Tr.	In.
21	49			I.	Tr.	In.		14	35		I.*	Sh.	Eg.		4	40		II.	Sh.	In.
23	16			II.	Sh.	Eg.		14	35		I.*	Tr.	Eg.		5	10		I.	Tr.	Eg.
23	44			I.	Sh.	Eg.		15	12		II.*	Tr.	Eg.		5	27		I.	Sh.	Eg.
23	49			II.	Tr.	Eg.		15	13		II.*	Sh.	Eg.		6	35		II.*	Tr.	Eg.
7	0	1		I.	Tr.	Eg.	18	9	38		I.*	Oc.	Dis.		7	10		II.*	Sh.	Eg.
18	46	23		I.	Ec.	Dis.		11	49		I.*	Oc.	Re.	29	0	13		I.	Oc.	Dis.
21	13			I.	Oc.	Re.	19	6	50		I.*	Tr.	In.		2	40	42	I.	Ec.	Re.
8	14	53	39	III.*	Ec.	Dis.		6	50		I.*	Sh.	In.		21	25		I.	Tr.	In.
15	28	42		II.*	Ec.	Dis.		7	18		II.*	Oc.	Dis.		21	43		I.	Sh.	In.
15	59			I.*	Sh.	In.		8	55		III.*	Sh.	In.		22	38		II.	Oc.	Dis.
16	15			I.*	Tr.	In.		9	1		I.*	Tr.	Eg.		23	36		I.	Tr.	Eg.
17	32			III.	Oc.	Re.		9	4		I.*	Sh.	Eg.		23	56		I.	Sh.	Eg.
18	12			I.	Sh.	Eg.		9	4		III.*	Tr.	In.	30	1	38	47	II.	Ec.	Re.
18	23			II.	Oc.	Re.		9	42		II.*	Oc.	Re.		1	48		III.	Oc.	Dis.
18	26			I.	Tr.	Eg.		10	34		III.*	Tr.	Eg.		4	45	56	III.	Ec.	Re.
9	13	15	4	I.*	Ec.	Dis.		10	58		III.*	Sh.	Eg.		18	39		I.	Oc.	Dis.
15	39			I.*	Oc.	Re.	20	4	3		I.	Oc.	Dis.		21	9	27	I.	Ec.	Re.
10	10	5		II.*	Sh.	In.		6	16	36	I.*	Ec.	Re.	31	15	51		I.*	Tr.	In.
10	28			I.*	Sh.	In.	21	1	15		I.	Tr.	In.		16	11		I.*	Sh.	In.
10	33			II.*	Tr.	In.		1	19		I.	Sh.	In.		17	19		II.	Tr.	In.
10	41			I.*	Tr.	In.		1	56		II.	Tr.	In.		18	0		II.	Sh.	In.
12	35			II.*	Sh.	Eg.		2	2		II.	Sh.	In.		18	2		I.	Tr.	Eg.
12	41			I.*	Sh.	Eg.		3	27		I.	Tr.	Eg.		18	24		I.	Sh.	Eg.
12	52			I.*	Tr.	Eg.		3	32		I.	Sh.	Eg.		19	44		II.	Tr.	Eg.
12	57			II.*	Tr.	Eg.		4	20		II.	Tr.	Eg.		20	30		II.	Sh.	Eg.
11	7	43	53	I.*	Ec.	Dis.		4	32		II.	Sh.	Eg.							

NOTE.—In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; \* Visible at Washington.

## WASHINGTON MEAN TIME.

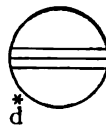
OCTOBER.

*Phases of the Eclipses of the Satellites for an Inverting Telescope.*

I.



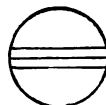
III.



II.



IV. No Eclipse.

*Configurations at 11<sup>h</sup> 30<sup>m</sup> for an Inverting Telescope.*

Day.	West.			East.		
1		4'	'2	○	I'	'3 ●
2	4'			○	'2 '3	'1 ●
3	4'		'2	○		3'
4	'4		'2	○	'1	3'
5	'4		'3	○	'2	
6		'4	3'	○	'2	
7		'3	'4 2'	○	'1	
8			'2	○	I'	
9			'1	○	'3	'4
10	○ 2'	○ I'		○		'3 '4
11		'2		○	'1	3'
12			I' 3'	○	'2	'4
13		3'		○	'1 2'	4'
14		'3	2' '1	○		4'
15			'2	○	I'	4'
16		'1		○	4'	'3
17		4'		○	'2	'3
18	4'	'2		○	3'	'1 ●
19	○ 3'	4'	I'	○	'2	
20	4'	3'		○	'1	2'
21	'4	'3	'2	○		
22	'4		'2	○	I'	
23		'4	'1	○	'3 '2	
24		'4		○	1' 2'	'3
25		2'		○	'4	3'
26	○ 3'		I'	○	'4	'2 ●
27		3'		○	'1	2'
28		'3	1' 2'	○		'4
29			'2	○	'1	4'
30		'1		○	'3 '2	4'
31				○	1'	'3 4'

WASHINGTON MEAN TIME.													
NOVEMBER.													
d	h	m	s				d	h	m	s			
1	13	5		I.*	Oc.	Dis.	11	8	44		II.*	Tr.	In.
	15	38	21	I.*	Ec.	Re.		9	16		I.*	Sh.	Eg.
2	10	17		I.*	Tr.	In.		9	58		II.*	Sh.	In.
	10	40		I.*	Sh.	In.		11	10		II.*	Tr.	Eg.
	11	44		II.*	Oc.	Dis.		12	27		II.*	Sh.	Eg.
	12	28		I.*	Tr.	Eg.	12	3	43		I.	Oc.	Dis.
	12	53		I.*	Sh.	Eg.		6	31	32	I.*	Ec.	Re.
	14	56	32	II.*	Ec.	Re.	13	0	53		I.	Tr.	In.
	15	32		III.*	Tr.	In.		1	32		I.	Sh.	In.
	16	59		III.	Sh.	In.		3	6		I.	Tr.	Eg.
	17	10		III.	Tr.	Eg.		3	7		II.	Oc.	Dis.
	18	59		III.	Sh.	Eg.		3	45		I.	Sh.	Eg.
3	7	31		I.	Oc.	Dis.		6	49	57	II.*	Ec.	Re.
	10	7	9	I.	Ec.	Re.		8	23		III.*	Oc.	Dis.
4	4	43		I.	Tr.	In.		10	10		III.*	Oc.	Re.
	5	9		I.	Sh.	In.		11	5	38	III.*	Ec.	Dis.
	6	27		II.*	Tr.	In.		12	48	52	III.*	Ec.	Re.
	6	54		I.*	Tr.	Eg.		22	9		I.	Oc.	Dis.
	7	19		II.*	Sh.	In.	14	1	0	20	I.	Ec.	Re.
	7	22		I.*	Sh.	Eg.		19	20		I.	Tr.	In.
	8	52		II.*	Tr.	Eg.		20	1		I.	Sh.	In.
	9	49		II.*	Sh.	Eg.		21	32		I.	Tr.	Eg.
5	1	58		I.	Oc.	Dis.		21	53		II.	Tr.	In.
	4	36	3	I.	Ec.	Re.		22	14		I.	Sh.	Eg.
	23	9		I.	Tr.	In.		23	17		II.	Sh.	In.
	23	37		I.	Sh.	In.	15	0	20		II.	Tr.	Eg.
6	0	51		II.	Oc.	Dis.		1	47		II.	Sh.	Eg.
	1	21		I.	Tr.	Eg.		16	36		I.	Oc.	Dis.
	1	50		I.	Sh.	Eg.		19	29	16	I.	Ec.	Re.
	4	14	17	II.	Ec.	Re.	16	13	46		I.*	Tr.	In.
	5	5		III.	Oc.	Dis.		14	30		I.*	Sh.	In.
	6	46		III.*	Oc.	Re.		15	58		I.	Tr.	Eg.
	7	3	3	III.*	Ec.	Dis.		16	15		II.	Oc.	Dis.
	8	47	38	III.*	Ec.	Re.		16	43		I.	Sh.	Eg.
	20	24		I.	Oc.	Dis.		20	7	53	II.	Ec.	Re.
	23	4	51	I.	Ec.	Re.		22	7		III.	Tr.	In.
7	17	35		I.	Tr.	In.		23	57		III.	Tr.	Eg.
	18	6		I.	Sh.	In.	17	1	3		III.	Sh.	In.
	19	35		II.	Tr.	In.		3	0		III.	Sh.	Eg.
	19	47		I.	Tr.	Eg.		11	2		I.*	Oc.	Dis.
	20	19		I.	Sh.	Eg.		13	58	8	I.*	Ec.	Re.
	20	38		II.	Sh.	In.	18	8	12		I.*	Tr.	In.
	22	1		II.	Tr.	Eg.		8	59		I.*	Sh.	In.
	23	8		II.	Sh.	Eg.		10	25		I.*	Tr.	Eg.
8	14	50		I.*	Oc.	Dis.		11	3		II.*	Tr.	In.
	17	33	46	I.	Ec.	Re.		11	11		I.*	Sh.	Eg.
9	12	1		I.*	Tr.	In.		12	36		II.*	Sh.	In.
	12	35		I.*	Sh.	In.		13	30		II.*	Tr.	Eg.
	13	59		II.*	Oc.	Dis.		15	6		II.*	Sh.	Eg.
	14	13		I.*	Tr.	Eg.	19	5	29		I.*	Oc.	Dis.
	14	48		I.*	Sh.	Eg.		8	27	5	I.*	Ec.	Re.
	17	32	7	II.	Ec.	Re.	20	2	39		I.	Tr.	In.
	18	48		III.	Tr.	In.		3	27		I.	Sh.	In.
	20	31		III.	Tr.	Eg.		4	51		I.	Tr.	Eg.
	21	1		III.	Sh.	In.		5	24		II.*	Oc.	Dis.
	22	59		III.	Sh.	Eg.		5	40		I.*	Sh.	Eg.
10	9	16		I.*	Oc.	Dis.		9	25	50	II.*	Ec.	Re.
	12	2	35	I.*	Ec.	Re.		11	45		III.*	Oc.	Dis.
11	6	27		I.*	Tr.	In.		13	37		III.*	Oc.	Re.
	7	4		I.*	Sh.	In.		15	8	22	III.*	Ec.	Dis.
	8	39		I.*	Tr.	Eg.		16	50	18	III.	Ec.	Re.
	20	23	56	I.	Oc.	Dis.		20	23	56	I.	Oc.	Dis.
	21	2	55	I.	Ec.	Re.		21	2	55	I.	Ec.	Re.
	21	5		I.	Tr.	In.		21	5		I.	Tr.	In.
	21	56		I.	Sh.	In.		21	56		I.	Sh.	In.
	23	18		I.	Tr.	Eg.		23	18		I.	Tr.	Eg.
	22	0	9	I.	Sh.	Eg.		22	0	9	I.	Sh.	Eg.
	0	13		II.	Tr.	In.		0	13		II.	Tr.	In.
	1	56		II.	Sh.	In.		1	56		II.	Sh.	In.
	2	41		II.	Tr.	Eg.		2	41		II.	Tr.	Eg.
	4	25		II.	Sh.	Eg.		4	25		II.	Sh.	Eg.
	18	23		I.	Oc.	Dis.		18	23		I.	Oc.	Dis.
	21	24	53	I.	Ec.	Re.		21	24	53	I.	Ec.	Re.
	15	32		I.	Tr.	In.	23	15	32		I.	Tr.	In.
	16	25		I.	Sh.	In.		16	25		I.	Sh.	In.
	17	45		I.	Tr.	Eg.		17	45		I.	Tr.	Eg.
	18	33		II.	Oc.	Dis.		18	33		II.	Oc.	Dis.
	18	38		I.	Sh.	Eg.		18	38		I.	Sh.	Eg.
	22	43	51	II.	Ec.	Re.		22	43	51	II.	Ec.	Re.
	24	1	31	III.	Tr.	In.		24	1	31	III.	Tr.	In.
	3	26		III.	Tr.	Eg.		3	26		III.	Tr.	Eg.
	5	5		III.	Sh.	In.		5	5		III.	Sh.	In.
	7	2		III.*	Sh.	Eg.		7	2		III.*	Sh.	Eg.
	12	49		I.*	Oc.	Dis.		12	49		I.*	Oc.	Dis.
	15	53	45	I.	Ec.	Re.		15	53	45	I.	Ec.	Re.
	25	9	59	I.*	Tr.	In.		25	9	59	I.*	Tr.	In.
	10	54		I.*	Sh.	In.		10	54		I.*	Sh.	In.
	12	12		I.*	Tr.	Eg.		12	12		I.*	Tr.	Eg.
	13	6		I.*	Sh.	Eg.		13	6		I.*	Sh.	Eg.
	13	24		II.*	Tr.	In.		13	24		II.*	Tr.	In.
	15	15		II.	Sh.	In.		15	15		II.	Sh.	In.
	15	54		II.	Tr.	Eg.		15	54		II.	Tr.	Eg.
	17	44		I.	Tr.	Eg.		17	44		I.	Tr.	Eg.
	26	7	16	I.*	Oc.	Dis.		26	7	16	I.*	Oc.	Dis.
	10	22	44	I.*	Ec.	Re.		10	22	44	I.*	Ec.	Re.
	27	4	26	I.	Tr.	In.		27	4	26	I.	Tr.	In.
	5	22		I.*	Sh.	In.		5	22		I.*	Sh.	In.
	6	38		I.*	Tr.	Eg.		6	38		I.*	Tr.	Eg.
	7	35		I.*	Sh.	Eg.		7	35		I.*	Sh.	Eg.
	7	43		II.*	Oc.	Dis.		7	43		II.*	Oc.	Dis.
	12	1	53	II.*	Ec.	Re.		12	1	53	II.*	Ec.	Re.
	15	11		III.	Oc.	Dis.		15	11		III.	Oc.	Dis.
	17	8		III.	Oc.	Re.		17	8		III.	Oc.	Re.
	19	10	44	III.	Ec.	Dis.		19	10	44	III.	Ec.	Dis.
	20	51	24	III.	Ec.	Re.		20	51	24	III.	Ec.	Re.
	28	1	43	I.	Oc.	Dis.		28	1	43	I.	Oc.	Dis.
	4	51	35	I.	Ec.	Re.		4	51	35	I.	Ec.	Re.
	1	Tr.	In.	I.	Tr.	In.		1	Tr.	In.	I.	Tr.	In.
	1	Sh.	In.	I.	Sh.	In.		1	Sh.	In.	I.	Sh.	In.
	1	Tr.	Eg.	I.	Tr.	Eg.		1	Tr.	Eg.	I.	Tr.	Eg.
	1	Sh.	Eg.	I.	Sh.	Eg.		1	Sh.	Eg.	I.	Sh.	Eg.
	1	Oc.	Dis.	I.	Oc.	Dis.		1	Oc.	Dis.	I.	Oc.	Dis.
	1	Ec.	Re.	I.	Ec.	Re.		1	Ec.	Re.	I.	Ec.	Re.
	1	Tr.	In.	I.	Tr.	In.		1	Tr.	In.	I.	Tr.	In.
	1	Sh.	In.	I.	Sh.	In.		1	Sh.	In.	I.	Sh.	In.
	1	Tr.	Eg.	I.	Tr.	Eg.		1	Tr.	Eg.	I.	Tr.	Eg.
	1	Sh.	Eg.	I.	Sh.	Eg.		1	Sh.	Eg.	I.	Sh.	Eg.
	1	Oc.	Dis.	I.	Oc.	Dis.		1	Oc.	Dis.	I.	Oc.	Dis.
	1	Ec.	Re.	I.	Ec.	Re.		1	Ec.	Re.	I.	Ec.	Re.
	1	Tr.	In.	I.	Tr.	In.		1	Tr.	In.	I.	Tr.	In.
	1	Sh.	In.	I.	Sh.	In.		1	Sh.	In.	I.	Sh.	In.
	1	Tr.	Eg.	I.	Tr.	Eg.		1	Tr.	Eg.	I.	Tr.	Eg.
	1	Sh.	Eg.	I.	Sh.	Eg.		1	Sh.	Eg.	I.	Sh.	Eg.
	1	Oc.	Dis.	I.	Oc.	Dis.		1	Oc.	Dis.	I.	Oc.	Dis.
	1	Ec.	Re.	I.	Ec.	Re.		1	Ec.	Re.	I.	Ec.	Re.
	1	Tr.	In.	I.	Tr.	In.		1	Tr.	In.	I.	Tr.	In.
	1	Sh.	In.	I.	Sh.	In.		1	Sh.	In.	I.	Sh.	In.
	1	Tr.	Eg.	I.	Tr.	Eg.		1	Tr.	Eg.	I.	Tr.	Eg.
	1	Sh.	Eg.	I.	Sh.	Eg.		1	Sh.	Eg.	I.	Sh.	Eg.
	1	Oc.	Dis.	I.	Oc.	Dis.		1	Oc.	Dis.	I.	Oc.	Dis.
	1	Ec.	Re.	I.	Ec.	Re.		1	Ec.	Re.	I.	Ec.	Re.
	1	Tr.	In.	I.	Tr.	In.		1	Tr.	In.	I.	Tr.	In.
	1	Sh.	In.	I.	Sh.	In.		1	Sh.	In.	I.	Sh.	In.
	1	Tr.	Eg.	I.	Tr.	Eg.		1	Tr.	Eg.	I.	Tr.	Eg.
	1	Sh.	Eg.	I.	Sh.	Eg.		1	Sh.	Eg.	I.	Sh.	Eg.
	1	Oc.	Dis.	I.	Oc.	Dis.		1	Oc.	Dis.	I.	Oc.	Dis.
	1	Ec.	Re.	I.	Ec.	Re.		1	Ec.	Re.	I.	Ec.	Re.
	1	Tr.	In.	I.	Tr.	In.		1	Tr.	In.	I.	Tr.	In.
	1	Sh.	In.	I.	Sh.	In.		1	Sh.	In.	I.	Sh.	In.
	1	Tr.	Eg.	I.	Tr.	Eg.		1	Tr.	Eg.	I.	Tr.	Eg.
	1	Sh.	Eg.	I.	Sh.	Eg.		1	Sh.	Eg.	I.	Sh.	Eg.
	1	Oc.	Dis.	I.	Oc.	Dis.		1	Oc.	Dis.	I.	Oc.	Dis.
	1	Ec.	Re.	I.	Ec.	Re.		1	Ec.	Re.	I.	Ec.	Re.
	1	Tr.	In.	I.	Tr.	In.		1	Tr.	In.	I.	Tr.	In.
	1	Sh.	In.	I.	Sh.	In.		1	Sh.	In.	I.	Sh.	In.
	1	Tr.	Eg.	I.	Tr.	Eg.		1	Tr.	Eg.	I.	Tr.	

NOTE.—In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

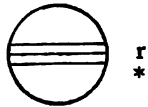
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; \* Visible at Washington.

## WASHINGTON MEAN TIME.

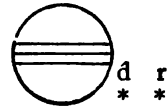
NOVEMBER.

*Phases of the Eclipses of the Satellites for an Inverting Telescope.*

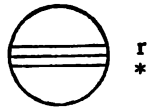
I.



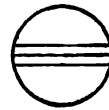
III.



II.



IV. No Eclipse.



*Configurations at 10<sup>h</sup> 30<sup>m</sup> for an Inverting Telescope.*

Day.	West.			East.		
1		2'	'1	○	4'	3'
2	○ 1'			○ 4'	3'	
3		4'	3'	○	'1	2'
4		4'	3'		'1	2'
5	4'		'3	○	'2	'1
6	4'		'1	○	'3	'2
7	'4			○	'1	'2
8	'4	2'	'1	○		3'
9		'4	'2	○	'1	3'
10		3'	'4	○	'2	'1
11	○ 2'	3'	'1	○	'4	
12		'3	'2	○	'1	'4
13			'1	○	'2	'4
14				○	'1	2'
15		2'	'1	○	3'	4'
16			'2	○	'1	3'
17		3'	'1	○	'2	4'
18	○ 1'	3'		○ 2'	4'	
19		'3	'2	○	'1	
20		4'	'1	○	'3	'2
21	4'			○	'1	2'
22	4'		2''	○		3'
23	'4		'2	○	'1	3'
24	'4		3'	○	'1	2'
25	○ 1'	'4	3'	○	2'	
26		'3	2'	○	'1	
27			'1	○	'4	
28				○	'1	2''
29			'1	○		3'
30		'2		○	'1	3'

## WASHINGTON MEAN TIME.

## DECEMBER

d	h	m	s				d	h	m	s				d	h	m	s					
1	1	20	0	II.	Ec.	Re.	11	22	19				III.	Oc.	Dis.	22	6	41		II.*	Oc.	Re.
5	1			III.	Tr.	In.	12	0	24				III.	Oc.	Re.	6	45	17		II.*	Ec.	Dis.
7	0			III.*	Tr.	Eg.	3	15	45				III.	Ec.	Dis.	9	9	32		II.*	Ec.	Re.
9	8			III.*	Sh.	In.	4	54	6				III.	Ec.	Re.	15	58			III.	Tr.	In.
11	4			III.*	Sh.	Eg.	5	23					I.*	Oc.	Dis.	18	8			III.	Tr.	Eg.
14	37			I.	Oc.	Dis.	8	43	4				I.*	Ec.	Re.	20	9			I.	Oc.	Dis.
17	49	27		I.	Ec.	Re.	13	2	31				I.	Tr.	In.	21	16			III.	Sh.	In.
2	11	47		I.*	Tr.	In.	3	42					I.	Sh.	In.	23	8			III.	Sh.	Eg.
12	49			I.*	Sh.	In.	4	44					I.	Tr.	Eg.	23	36	46		I.	Ec.	Re.
14	0			I.	Tr.	Eg.	5	55					I.*	Sh.	Eg.	23	17	18		I.	Tr.	In.
15	2			I.	Sh.	Eg.	7	27					II.*	Tr.	In.	18	35			I.	Sh.	In.
15	47			II.	Tr.	In.	9	52					II.*	Sh.	In.	19	32			I.	Tr.	Eg.
17	54			II.	Sh.	In.	9	57					II.*	Tr.	Eg.	20	48			I.	Sh.	Eg.
18	16			II.	Tr.	Eg.	12	21					II.*	Sh.	Eg.	23	12			II.	Tr.	In.
20	23			II.	Sh.	Eg.	23	50					I.	Oc.	Dis.	24	1	44		II.	Tr.	Eg.
3	9	5		I.*	Oc.	Dis.	14	3	12	3			I.	Ec.	Re.	1	49			II.	Sh.	In.
12	18	26		I.*	Ec.	Re.	20	58					I.	Tr.	In.	4	18			II.	Sh.	Eg.
4	6	14		I.*	Tr.	In.	22	11					I.	Sh.	In.	14	38			I.	Oc.	Dis.
7	18			I.*	Sh.	In.	23	12					I.	Tr.	Eg.	18	5	47		I.	Ec.	Re.
8	27			I.*	Tr.	Eg.	15	0	24				I.	Sh.	Eg.	25	11	46		I.*	Tr.	In.
9	30			I.*	Sh.	Eg.	1	42					II.	Oc.	Dis.	13	4			I.	Sh.	In.
10	5			II.*	Oc.	Dis.	6	32	51				II.*	Ec.	Re.	14	0			I.	Tr.	Eg.
14	38	8		II.	Ec.	Re.	12	14					III.*	Tr.	In.	15	17			I.	Sh.	Eg.
18	42			III.	Oc.	Dis.	14	20					III.	Tr.	Eg.	17	26			II.	Oc.	Dis.
20	43			III.	Oc.	Re.	17	13					III.	Sh.	In.	19	57			II.	Oc.	Re.
23	13	8		III.	Ec.	Dis.	18	18					I.	Oc.	Dis.	20	3	44		II.	Ec.	Dis.
5	0	52	32	III.	Ec.	Re.	19	6					III.	Sh.	Eg.	22	28	0		II.	Ec.	Re.
3	32			I.	Oc.	Dis.	21	40	58				I.	Ec.	Re.	26	5	49		III.*	Oc.	Dis.
6	47	18		I.*	Ec.	Re.	15	26					I.	Tr.	In.	8	0			III.*	Oc.	Re.
0	41			I.	Tr.	In.	16	40					I.	Sh.	In.	9	6			I.*	Oc.	Dis.
1	47			I.	Sh.	In.	17	40					I.	Tr.	Eg.	11	22	9		III.*	Ec.	Dis.
2	54			I.	Tr.	Eg.	18	52					I.	Sh.	Eg.	12	34	41		I.*	Ec.	Re.
3	59			I.	Sh.	Eg.	20	42					II.	Tr.	In.	12	57	57		III.	Ec.	Re.
5	0			II.*	Tr.	In.	23	11					II.	Sh.	In.	27	6	14		I.*	Tr.	In.
7	13			II.*	Sh.	In.	23	12					II.	Tr.	Eg.	7	33			I.*	Sh.	In.
7	29			II.*	Tr.	Eg.	17	1	40				II.	Sh.	Eg.	8	28			I.*	Tr.	Eg.
9	42			II.*	Sh.	Eg.	12	45					I.	Oc.	Dis.	9	46			I.*	Sh.	Eg.
21	59			I.	Oc.	Dis.	16	9	59				I.	Ec.	Re.	12	29			II.*	Tr.	In.
1	16	17		I.	Ec.	Re.	18	9	54				I.*	Tr.	In.	15	0			II.	Tr.	Eg.
19	8			I.	Tr.	In.	11	9					I.*	Sh.	In.	15	8			II.	Sh.	In.
20	16			I.	Sh.	In.	12	8					I.*	Tr.	Eg.	17	38			II.	Sh.	Eg.
21	21			I.	Tr.	Eg.	13	21					I.*	Sh.	Eg.	28	3	34		I.	Oc.	Dis.
22	28			I.	Sh.	Eg.	14	56					II.	Oc.	Dis.	7	3	40		I.*	Ec.	Re.
23	17			II.	Oc.	Dis.	17	27					II.	Oc.	Re.	29	0	43		I.	Tr.	In.
8	3	56	20	II.	Ec.	Re.	17	26	58				II.	Ec.	Dis.	2	2			I.	Sh.	In.
8	34			III.*	Tr.	In.	19	51	12				II.	Ec.	Re.	2	56			I.	Tr.	Eg.
10	37			III.*	Tr.	Eg.	2	1					III.	Oc.	Dis.	4	15			I.	Sh.	Eg.
13	11			III.*	Sh.	In.	4	9					III.	Oc.	Re.	6	42			II.*	Oc.	Dis.
15	5			III.	Sh.	Eg.	7	13					I.*	Oc.	Dis.	9	13			II.*	Oc.	Re.
16	27			I.	Oc.	Dis.	7	18	43				III.*	Ec.	Dis.	9	22	6		II.*	Ec.	Dis.
19	45	II		I.	Ec.	Re.	8	55	42				III.*	Ec.	Re.	11	46	35		II.*	Ec.	Re.
9	13	36		I.*	Tr.	In.	10	38	52				I.*	Ec.	Re.	19	48			III.	Tr.	In.
14	44			I.	Sh.	In.	20	4	22				I.	Tr.	In.	22	0			III.	Tr.	Eg.
15	49			I.	Tr.	Eg.	5	38					I.*	Sh.	In.	22	3			I.	Oc.	Dis.
16	56			I.	Sh.	Eg.	6	36					I.*	Tr.	Eg.	30	1	18		III.	Sh.	In.
18	13			II.	Tr.	In.	7	50					I.*	Sh.	Eg.	1	32	35		I.	Ec.	Re.
20	32			II.	Sh.	In.	9	57					II.*	Tr.	In.	3	9			III.	Sh.	Eg.
20	43			II.	Tr.	Eg.	12	27					II.*	Tr.	Eg.	19	11			I.	Tr.	In.
23	2			II.	Sh.	Eg.	12	30					II.*	Sh.	In.	20	31			I.	Sh.	In.
10	10	54		I.*	Oc.	Dis.	14	59					II.	Sh.	Eg.	21	25			I.	Tr.	Eg.
14	14	II		I.	Ec.	Re.	21	1	41				I.	Oc.	Dis.	22	44			I.	Sh.	Eg.
11	8	3		I.*	Tr.	In.	5	7	51				I.*	Ec.	Re.	31	1	46		II.	Tr.	In.
9	13			I.*	Sh.	In.	22	50					I.	Tr.	In.	4	17			II.	Tr.	Eg.
10	16			I.*	Tr.	Eg.	22	0	6				I.	Sh.	In.	4	27			II.	Sh.	In.
11	26			I.*	Sh.	Eg.	1	4					I.	Tr.	Eg.	6	57			II.*	Sh.	Eg.
12	29			II.*	Oc.	Dis.	2	19					I.	Sh.	Eg.	16	31			I.	Oc.	Dis.
17	14	35		II.	Ec.	Re.	4	11					II.	Oc.	Dis.	20	1	35		I.	Ec.	Re.

NOTE.—In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

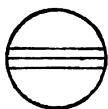
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; \* Visible at Washington.

WASHINGTON MEAN TIME.

DECEMBER.

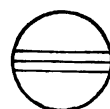
*Phases of the Eclipses of the Satellites for an Inverting Telescope.*

I.



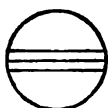
r  
\*

III.



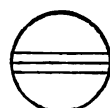
d r  
\* \*

II.



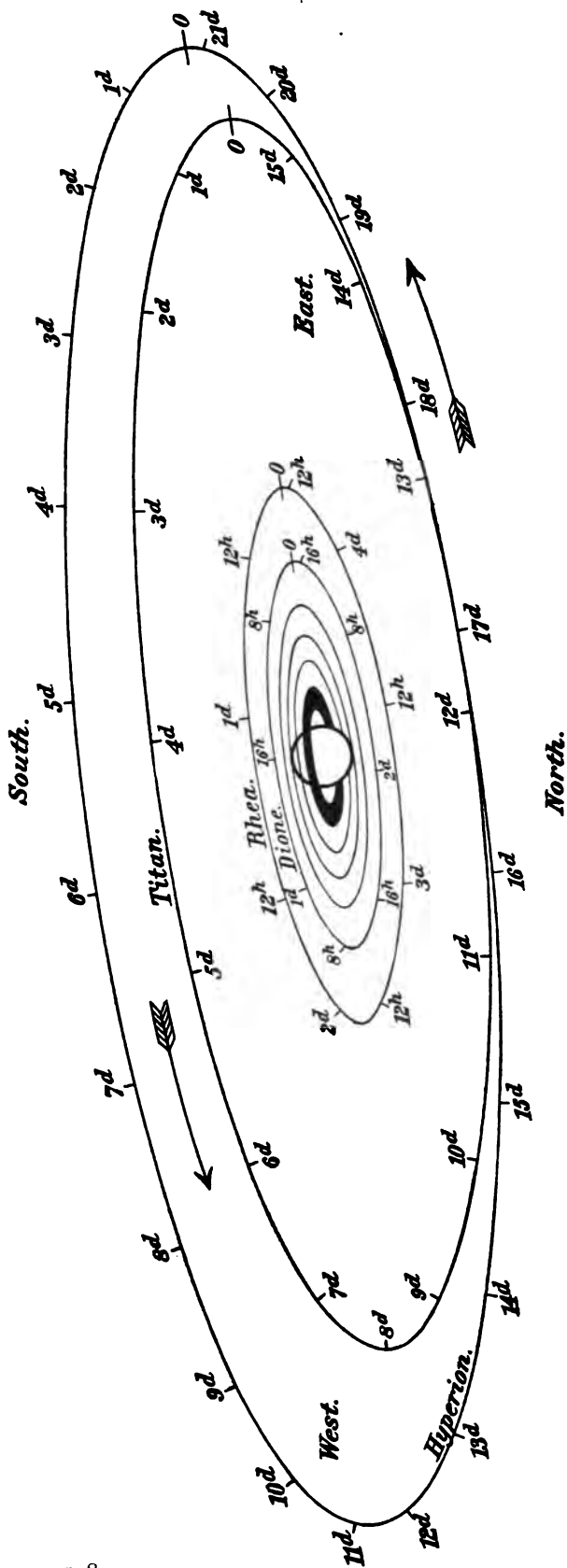
r  
\*

IV. No Eclipse.



*Configurations at 9<sup>h</sup> 30<sup>m</sup> for an Inverting Telescope.*

Day.	West.		East.	
1		'1 3' ○	'2	'4
2	3'	○	'1 2'	4'
3	'3 2'	○	4'	'1 ●
4	'3 1' 2'	○	4'	
5		○	4' '1 '3 '2	
6	4' '1 2'	○	'3	
7	4' '2	○	'1 3'	
8	○ 3' 4' '1	○	'2	
9	4' 3'	○	'1 2'	
10	'4 '3 2' '1	○		
11	○ '1 '4 '3 '2	○		
12	'4	○	'1 '3 '2	
13	○ 2' '1 4'	○	'3	
14	'2	○	'4 '1 3'	
15	'1	○	3' '2 '4	
16	3'	○	'1 2' '4	
17	'3 2' '1	○	'4	
18	'3 '2	○	'1 4'	
19		○	'3 '2 4' '1 ●	
20	○ 2' '1	○	'3 4'	
21	'2	○	'1 4' 3'	
22	'1 4'	○	3' 2'	
23	4' 3'	○	'1 2'	
24	4' 3' 2' '1	○		
25	4' '3 '2	○	'1	
26	4' '3 '2	○	'1 ●	
27	'4 '1 2' '3	○		
28	'4 2' '1	○	'1 3'	
29	'4 '1	○	3' '2 ●	
30	3' '4	○	'1 2'	
31	3' '1 2'	○	'4	



NAMES OF THE  
SATELLITES.

- I. Mimas.
- II. Enceladus.
- III. Tethys.
- IV. Dione.
- V. Rhea.
- VI. Titan.
- VII. Hyperion.
- VIII. Iapetus.

MEAN SYNODIC PERIODS.	
	d h
I.	0 22.6
II.	1 8.9
III.	1 21.3
IV.	2 17.7
V.	4 12.5
VI.	15 23.3
VII.	21 7.6
VIII.	79 22.1

APPARENT ORBITS OF THE SEVEN INNER SATELLITES OF SATURN,

AT OPPOSITION IN 1904.

AS SEEN IN AN INVERTING TELESCOPE.



## WASHINGTON MEAN TIME OF GREATEST ELONGATION, ETC.

In the diagram on the preceding page, the points of the orbits marked "o" are those of the eastern elongation, as seen in an inverting telescope. The times of these elongations may be found from the following tables, and the apparent position of a satellite at any other time may be marked on the diagram by setting off on the proper orbit the elapsed interval in days and hours since the last eastern elongation. The orbits of the five inner satellites are regarded as circular, and the time of any elongation not given in the tables may be readily found from those given by adding or subtracting the proper multiple of the mean synodic period. Mimas can be seen only within a few hours of each elongation, and the time of every elongation visible at Washington is given. For the three outer satellites the eccentricity is taken into account, and the times both of the elongations and of the conjunctions are given. The following abbreviations are used in the tables:—

E., East Elongation,  
I., Inferior Conjunction (south of planet),  
W., West Elongation,  
S., Superior Conjunction (north of planet).

## MIMAS.

*Greatest Elongations Visible at Washington.*

May 15 15.1 W.	July 3 15.0 W.	Aug. 1 8.7 E.	Aug. 29 15.1 E.	Sept. 26 10.2 W.	Nov. 1 5.7 W.
16 13.7 W.	4 13.6 W.	4 15.7 W.	30 13.7 E.	27 8.8 W.	6 10.1 E.
23 15.3 E.	5 12.2 W.	5 14.4 W.	31 12.3 E.	Oct. 3 11.8 E.	7 8.8 E.
24 13.9 E.	11 15.2 E.	6 13.1 W.	Sept. 1 10.9 E.	4 10.4 E.	8 7.4 E.
31 15.5 W.	12 13.8 E.	7 11.7 W.	2 9.5 E.	5 9.1 E.	9 6.0 E.
June 1 14.1 W.	13 12.4 E.	8 10.3 W.	3 8.1 E.	6 7.7 E.	15 9.1 W.
2 12.7 W.	14 11.1 E.	12 16.0 E.	7 13.9 W.	7 6.3 E.	16 7.7 W.
8 15.8 E.	15 9.7 E.	13 14.7 E.	8 12.5 W.	11 12.1 W.	17 6.3 W.
9 14.4 E.	19 15.4 W.	14 13.3 E.	9 11.1 W.	12 10.7 W.	23 9.3 E.
10 13.0 E.	20 14.0 W.	15 11.9 E.	10 9.8 W.	13 9.3 W.	24 8.0 E.
16 16.0 W.	21 12.7 W.	16 10.5 E.	11 8.4 W.	14 7.9 W.	25 6.6 E.
17 14.6 W.	22 11.3 W.	17 9.1 E.	16 12.7 E.	20 11.0 E.	Dec. 2 8.3 W.
18 13.2 W.	23 9.9 W.	18 7.7 E.	17 11.4 E.	21 9.6 E.	3 6.9 W.
19 11.8 W.	27 15.6 E.	21 14.9 W.	18 10.0 E.	22 8.2 E.	4 5.5 W.
25 14.8 E.	28 14.2 E.	22 13.5 W.	19 8.6 E.	23 6.8 E.	11 7.2 E.
26 13.4 E.	29 12.9 E.	23 12.1 W.	20 7.2 E.	29 9.9 W.	12 5.8 E.
27 12.0 E.	30 11.5 E.	24 10.7 W.	24 13.0 W.	30 8.5 W.	19 7.5 W.
28 10.6 E.	31 10.1 E.	25 9.3 W.	25 11.6 W.	31 7.1 W.	20 6.1 W.

## ENCELADUS.

May 13 6.4 E.	May 26 23.2 E.	June 9 16.0 E.	June 23 8.8 E.	July 7 1.6 E.	July 20 18.4 E.
14 15.3 E.	28 8.1 E.	11 0.9 E.	24 17.7 E.	8 10.5 E.	22 3.2 E.
16 0.2 E.	29 17.0 E.	12 9.8 E.	26 2.6 E.	9 19.4 E.	23 12.1 E.
17 9.0 E.	31 1.9 E.	13 18.7 E.	27 11.5 E.	11 4.2 E.	24 21.0 E.
18 17.9 E.	June 1 10.8 E.	15 3.6 E.	28 20.4 E.	12 13.1 E.	26 5.9 E.
20 2.8 E.	2 19.6 E.	16 12.4 E.	30 5.2 E.	13 22.0 E.	27 14.7 E.
21 11.7 E.	4 4.5 E.	17 21.3 E.	July 1 14.1 E.	15 6.9 E.	28 23.6 E.
22 20.6 E.	5 13.4 E.	19 6.2 E.	2 23.0 E.	16 15.7 E.	30 8.5 E.
24 5.4 E.	6 22.3 E.	20 15.1 E.	4 7.8 E.	18 0.6 E.	31 17.4 E.
25 14.3 E.	8 7.2 E.	22 0.0 E.	5 16.7 E.	19 9.5 E.	Aug. 2 2.2 E.

## WASHINGTON MEAN TIME OF GREATEST ELONGATION.

## ENCELADUS—(Continued).

Aug. 3 11.1 E. 4 20.0 E. 6 4.9 E. 7 13.7 E. 8 22.6 E.  10 7.5 E. 11 16.4 E. 13 1.2 E. 14 10.1 E. 15 19.0 E.  17 3.9 E. 18 12.7 E. 19 21.6 E. 21 6.5 E. 22 15.4 E.	Aug. 24 0.2 E. 25 9.1 E. 26 18.0 E. 28 2.9 E. 29 11.7 E.  30 20.6 E. Sept. 1 5.5 E. 2 14.4 E. 3 23.2 E. 5 8.1 E.  6 17.0 E. 8 1.9 E. 9 10.8 E. 10 19.6 E. 12 4.5 E.	Sept. 13 13.4 E. 14 22.3 E. 16 7.2 E. 17 16.0 E. 19 0.9 E.  20 9.8 E. 21 18.7 E. 23 3.6 E. 24 12.4 E. 25 21.3 E.  27 6.2 E. 28 15.1 E. 30 0.0 E. Oct. 1 8.9 E. 2 17.8 E.	Oct. 4 2.6 E. 5 11.5 E. 6 20.4 E. 8 5.3 E. 9 14.2 E.  10 23.1 E. 12 7.9 E. 13 16.8 E. 15 1.7 E. 16 10.6 E.  17 19.5 E. 19 4.4 E. 20 13.3 E. 21 22.2 E. 23 7.0 E.	Oct. 24 15.9 E. 26 0.8 E. 27 9.7 E. 28 18.6 E. 30 3.5 E.  31 12.4 E. Nov. 1 21.3 E. 3 6.2 E. 4 15.1 E. 6 0.0 E.  7 8.8 E. 8 17.7 E. 10 2.6 E. 11 11.5 E. 12 20.4 E.	Nov. 14 5.3 E. 15 14.2 E. 16 23.1 E. 18 8.0 E. 19 16.9 E.  21 1.8 E. 22 10.7 E. 23 19.6 E. 25 4.5 E. 26 13.4 E.  27 22.3 E. 30 7.2 E. Dec. 1 16.0 E. 2 0.9 E. 3 9.8 E.
---	---	--	--	---	--

## TETHYS.

May 16 5.6 E. 18 3.0 E. 20 0.3 E. 21 21.6 E. 23 18.9 E.  25 16.2 E. 27 13.5 E. 29 10.8 E. 31 8.1 E. June 2 5.4 E.  4 2.7 E. 6 0.0 E. 7 21.3 E. 9 18.6 E. 11 15.9 E.  13 13.2 E. 15 10.5 E. 17 7.8 E.	June 19 5.1 E. 21 2.4 E. 22 23.7 E. 24 21.0 E. 26 18.3 E.  28 15.6 E. 30 12.9 E. July 2 10.2 E. 4 7.5 E. 6 4.7 E.  8 2.0 E. 9 23.3 E. 11 20.6 E. 13 17.9 E. 15 15.2 E.  17 12.5 E. 19 9.8 E. 21 7.1 E.	July 23 4.3 E. 25 1.6 E. 26 22.9 E. 28 20.2 E. 30 17.5 E.  Aug. 1 14.8 E. 3 12.1 E. 5 9.4 E. 7 6.7 E. 9 4.0 E.  11 1.2 E. 12 22.5 E. 14 19.8 E. 16 17.1 E. 18 14.4 E.  20 11.7 E. 22 9.0 E. 24 6.3 E.	Aug. 26 3.5 E. 28 0.8 E. 29 22.1 E. 31 19.4 E. Sept. 2 16.7 E.  4 14.0 E. 6 11.3 E. 8 8.6 E. 10 5.9 E. 12 3.2 E.  14 0.5 E. 15 21.8 E. 17 19.1 E. 19 16.4 E. 21 13.7 E.  23 11.0 E. 25 8.3 E. 27 5.6 E.	Sept. 29 2.9 E. Oct. 1 0.2 E. 2 21.5 E. 4 18.8 E. 6 16.1 E.  8 13.4 E. 10 10.7 E. 12 8.0 E. 14 5.3 E. 16 2.6 E.  17 23.9 E. 19 21.3 E. 21 18.6 E. 23 15.9 E. 25 13.2 E.  27 10.5 E. 29 7.8 E. 31 5.1 E.	Nov. 2 2.4 E. 3 23.8 E. 5 21.1 E. 7 18.4 E. 9 15.7 E.  11 13.0 E. 13 10.4 E. 15 7.7 E. 17 5.0 E. 19 2.3 E.  20 23.7 E. 22 21.0 E. 24 18.3 E. 26 15.6 E. 28 13.0 E.  30 10.3 E. Dec. 2 7.6 E. 4 4.9 E.
--	--	---	---	---	---

## DIONE.

May 16 3.6 E. 18 21.3 E. 21 15.0 E. 24 8.7 E. 27 2.4 E.  29 20.0 E. June 1 13.7 E. 4 7.4 E. 7 1.1 E. 9 18.7 E.  12 12.4 E. 15 6.1 E.	June 17 23.7 E. 20 17.4 E. 23 11.0 E. 26 4.7 E. 28 22.4 E.  July 1 16.0 E. 4 9.7 E. 7 3.3 E. 9 21.0 E. 12 14.7 E.  15 8.3 E. 18 1.9 E.	July 20 19.6 E. 23 13.2 E. 26 6.9 E. 29 0.5 E. 31 18.2 E.  Aug. 3 11.8 E. 6 5.4 E. 8 23.1 E. 11 16.8 E. 14 10.4 E.  17 4.1 E. 19 21.7 E.	Aug. 22 15.4 E. 25 9.0 E. 28 2.6 E. 30 20.3 E. Sept. 2 13.9 E.  5 7.6 E. 8 1.2 E. 10 18.9 E. 13 12.6 E. 16 6.2 E.  18 23.9 E. 21 17.6 E.	Sept. 24 11.2 E. 27 4.9 E. 29 22.6 E. Oct. 2 16.2 E. 5 9.9 E.  8 3.6 E. 10 21.3 E. 13 15.0 E. 16 8.7 E. 19 2.4 E.  21 20.0 E. 24 13.7 E.	Oct. 27 7.4 E. 30 1.1 E. Nov. 1 18.8 E. 4 12.6 E. 7 6.3 E.  10 0.0 E. 12 17.7 E. 15 11.4 E. 18 5.1 E. 20 22.8 E.  23 16.5 E. 26 10.3 E.
---	---	---	---	---	--

RHEA.				TITAN.				HYPERION.				
	d	h			d	h			d			
May	12	22.1	E.	Aug.	20	5.9	E.	May	19	2.5	S.	
	17	10.5	E.		24	18.2	E.		23	3.0	E.	
	21	22.9	E.		29	6.5	E.		27	6.0	I.	
	26	11.4	E.		Sept.	2	18.9		E.	31	4.2	W.
	30	23.8	E.			7	7.2		E.	4	0.0	S.
June	4	12.2	E.	June		11	19.6	E.	Sept.	8	0.5	E.
	9	0.6	E.			16	7.9	E.		12	3.6	I.
	13	13.0	E.			20	20.2	E.		16	1.9	W.
	18	1.3	E.		25	8.6	E.	19		21.6	S.	
	22	13.7	E.		29	21.0	E.	23		22.2	E.	
July	27	2.1	E.	Oct.	4	9.4	E.	July	28	1.3	I.	
	1	14.4	E.		8	21.8	E.		1	23.7	W.	
	6	2.7	E.		13	10.2	E.		5	19.7	S.	
	10	15.1	E.		17	22.6	E.		9	20.5	E.	
	15	3.4	E.		22	11.0	E.		13	23.8	I.	
Aug.	19	15.7	E.	Nov.	26	23.5	E.	July	17	22.2	W.	
	24	4.0	E.		31	11.9	E.		21	18.2	S.	
	28	16.3	E.		5	0.4	E.		25	19.1	E.	
	2	4.6	E.		9	12.8	E.		29	22.5	I.	
	6	17.0	E.		14	1.3	E.		Nov.	2	21.2	W.
	11	5.3	E.		18	13.8	E.		6	17.2	S.	
	15	17.6	E.		23	2.4	E.		Aug.	5.7	I.	
										11.6	W.	
							16.7	S.		Dec.	5.2	E.
									10.9		I.	

IAPETUS.

May	d	June	d	Aug.	d	Sept.	d	Oct.	d	Dec.	d
June	21.4 I.	July	30.7 S.		8.0 I.	Oct.	16.7 S.	Nov.	25.5 I.		6.3 S.
	10.9 W.		19.6 E.		28.1 W.		5.7 E.		15.2 W.		24.8 E.

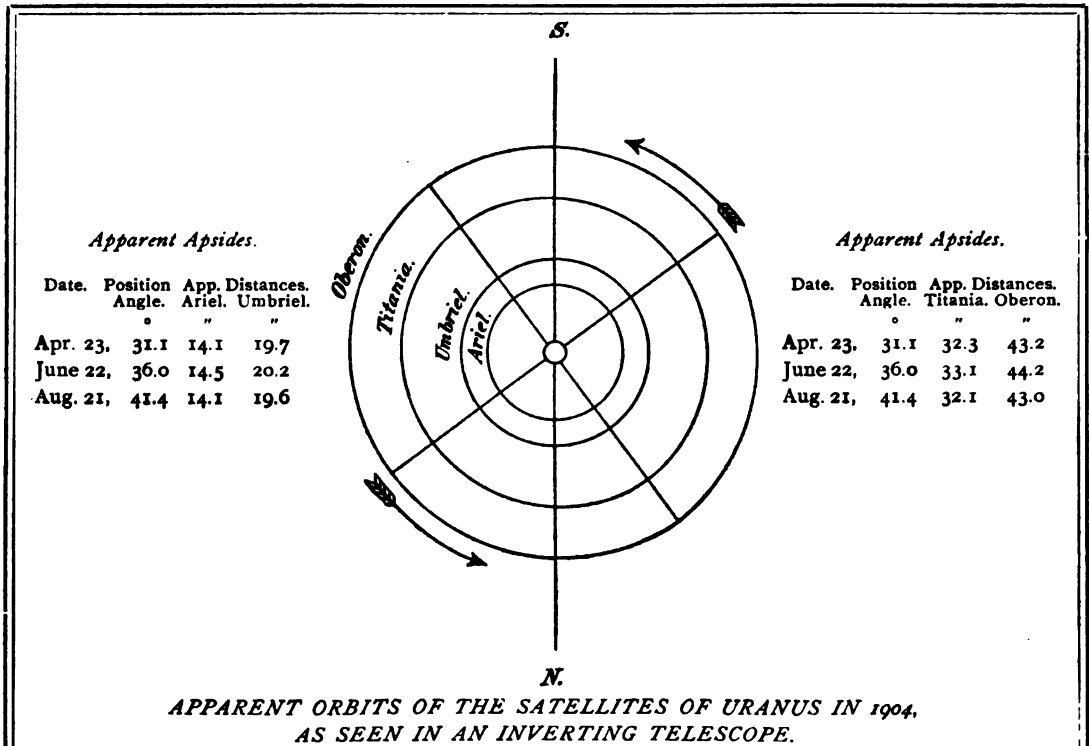
THE APPARENT ELEMENTS OF SATURN'S RINGS.

Greenwich Mean Noon.	<i>a</i> Outer Major Axis.	<i>b</i> Outer Minor Axis.	<i>i</i> Inclination of Northern Semi-Minor Axis to Circle of Declination from North to East.	<i>l</i> The Elevation of the Earth above the Plane of the Rings.	<i>l'</i> The Elevation of the Sun above the Plane of the Rings.	<i>u</i> <i>u'</i> Earth's Longitude from Saturn counted on the Plane of the Rings from their Ascending Node on the—	
						Equator.	Ecliptic.
Jan. 1	34.76	10.96	7 18.6	18 23.0	17 23.6	5 46.8	323 37.6
21	34.41	10.36	7 15.3	17 31.4	17 10.4	8 0.7	325 51.6
Feb. 10	34.39	9.82	7 10.6	16 35.2	16 57.1	10 18.8	328 9.7
Mar. 1	34.70	9.37	7 5.6	15 40.3	16 43.7	12 32.1	330 23.0
21	35.31	9.04	7 0.7	14 49.8	16 30.1	14 32.5	332 23.5
Apr. 10	36.21	8.84	6 56.4	14 7.8	16 16.5	16 12.2	334 3.2
30	37.34	8.80	6 53.0	13 38.0	16 2.8	17 24.6	335 15.8
May 20	38.61	8.94	6 51.0	13 23.2	15 48.9	18 4.4	335 55.7
June 9	39.91	9.26	6 50.9	13 25.2	15 34.9	18 8.4	335 59.8
29	41.07	9.74	6 52.6	13 43.3	15 20.9	17 37.2	335 28.8
July 19	41.91	10.31	6 55.7	14 14.4	15 6.6	16 36.4	334 28.0
Aug. 8	42.35	10.85	6 59.5	14 52.7	14 52.4	15 17.2	333 8.8
28	42.04	11.24	7 3.2	15 30.6	14 38.0	13 55.2	331 46.8
Sept. 17	41.31	11.39	7 6.0	16 0.7	14 23.5	12 47.0	330 38.7
Oct. 7	40.20	11.28	7 7.6	16 17.6	14 8.8	12 6.9	329 58.6
27	38.92	10.93	7 7.6	16 18.4	13 54.1	12 3.1	329 54.9
Nov. 16	37.63	10.40	7 6.1	16 2.5	13 39.3	12 37.5	330 29.4
Dec. 6	36.48	9.76	7 3.3	15 31.2	13 24.4	13 47.1	331 39.1
26	35.57	9.08	6 59.0	14 46.9	13 9.4	15 25.4	333 17.6
31	35.39	8.90	6 57.7	14 34.2	13 5.7	15 53.4	333 45.6

The factors to be multiplied by *a* and *b* to obtain the axes of—

The inner ellipse of the outer ring = 0.8801,	log factor = 9.9445
The outer ellipse of the inner ring = 0.8599,	log factor = 9.9344
The inner ellipse of the inner ring = 0.6650,	log factor = 9.8228
The inner ellipse of the dusky ring = 0.5130,	log factor = 9.7101

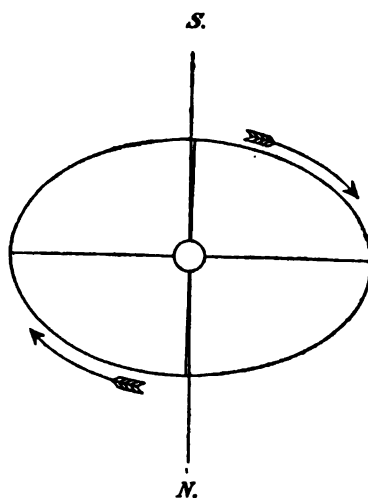
NOTE.—The positive sign of *l* indicates that the visible surface of the rings is the northern one.



## WASHINGTON MEAN TIME OF GREATEST ELONGATION.

ARIEL.		UMBRIEL.		TITANIA.		OBERON.
North.	South.	North.	South.	North.	South.	North and South.
d h	d h	d h	d h	d h	d h	d h
Apr. 13 4.4	Apr. 16 23.2	Apr. 8 0.8	Apr. 14 6.0	Mar. 29 16.0	Apr. 3 0.4	Apr. 28 7.6 N.
20 17.9	24 12.7	16 7.7	22 12.9	Apr. 7 8.9	11 17.4	May 5 1.4 S.
28 7.4	May 2 2.2	24 14.7	30 19.9	16 1.9	20 10.4	11 19.3 N.
May 5 20.9	9 15.7	May 2 21.7	May 9 2.9	24 18.9	29 3.5	18 13.2 S.
13 10.5	17 5.2	11 4.7	17 10.0	May 3 12.1	May 7 20.7	25 7.2 N.
21 0.0	24 18.8	19 11.7	25 17.0	12 5.3	16 13.9	June 1 1.2 S.
28 13.6	June 1 8.3	27 18.8	June 3 0.1	20 22.5	25 7.2	7 19.3 N.
June 5 3.1	8 21.9	June 5 1.9	11 7.3	29 15.8	June 3 0.5	14 13.4 S.
12 16.7	16 11.5	13 9.0	19 14.4	June 7 9.2	11 17.9	21 7.5 N.
20 6.3	24 1.1	21 16.2	27 21.5	16 2.6	20 11.3	28 1.7 S.
27 19.9	July 1 14.7	29 23.3	July 6 4.7	July 24 20.0	29 4.7	July 4 19.8 N.
July 5 9.5	9 4.3	July 8 6.5	14 11.8	July 3 13.5	July 7 22.2	11 14.0 S.
12 23.1	16 17.9	16 13.6	22 19.0	12 6.9	16 15.6	18 8.1 N.
20 12.7	24 7.5	24 20.8	31 2.1	21 0.3	25 9.0	25 2.2 S.
28 2.2	31 21.0	Aug. 2 3.9	Aug. 8 9.2	29 17.7	Aug. 3 2.3	31 20.2 N.
Aug. 4 15.8	Aug. 8 10.6	10 11.0	16 16.2	Aug. 7 11.0	11 19.6	Aug. 7 14.2 S.
12 5.4	16 0.2	18 18.0	24 23.3	16 4.2	20 12.8	14 8.1 N.
19 18.9	23 13.7	27 1.0	Sept. 2 6.2	24 21.4	29 5.9	21 2.0 S.
27 8.4	31 3.2	Sept. 4 8.0	10 13.1	Sept. 2 14.4	Sept. 6 22.9	27 19.7 N.
Sept. 3 21.9	Sept. 7 16.7	12 14.9	18 20.0	11 7.3	15 15.8	Sept. 3 13.3 S.
11 11.4	15 6.1	20 21.7	27 2.9	20 0.2	24 8.5	10 6.9 N.
19 0.9	22 19.6	29 4.6	Oct. 5 9.7	28 16.9	Oct. 3 1.2	17 0.3 S.
26 14.3	30 9.0	Oct. 7 11.4	13 16.4	Oct. 7 9.5	11 17.8	23 17.6 N.
Oct. 4 3.7	Oct. 7 22.4	15 18.1	21 23.1	16 2.0	20 10.3	30 10.9 S.
11 17.1	15 11.8	24 0.8	30 5.8	24 18.5	29 2.7	Oct. 7 4.0 N.
Period of Ariel, 2 12.489		Period of Titania, 8 16.942		Period of Umbriel, 4 3.460		Period of Oberon, 13 11.119

NOTE.—For Ariel only every third elongation is given, and for Umbriel every alternate one. The intermediate ones may be found by adding multiples of the period of the satellite.



Date.	Position Angle of Apsis. °	Apparent Distance at Apsis. "
Jan. 18,	85.4	16.8
Mar. 22,	84.4	16.3
Oct. 24,	90.5	16.5
Dec. 27,	88.8	16.9

*APPARENT ORBIT OF THE SATELLITE OF NEPTUNE IN 1904,  
AS SEEN IN AN INVERTING TELESCOPE.*

WASHINGTON MEAN TIME OF GREATEST ELONGATION.

East.		West.		East.		West.		East.		West.	
d	h	d	h	d	h	d	h	d	h	d	h
Jan. 2	21.9	Jan. 5	20.4	Mar. 13	11.1	Mar. 16	9.7	Oct. 28	13.3	Oct. 31	11.8
8	19.0	11	17.6	19	8.2	22	6.7	Nov. 3	10.4	Nov. 6	8.9
14	16.1	17	14.7	25	5.2	28	3.8	9	7.5	12	6.0
20	13.3	23	11.8	31	2.3	Apr. 3	0.8	15	4.6	18	3.1
26	10.4	29	9.0	Apr. 5	23.3	8	21.8	21	1.6	24	0.2
Feb. 1	7.5	Feb. 4	6.1	Sept. 17	10.1	Sept. 20	8.6	26	22.7	29	21.3
7	4.6	10	3.2	23	7.2	26	5.6	Dec. 2	19.9	5	18.4
13	1.7	16	0.3	29	4.2	Oct. 2	2.7	8	17.0	11	15.5
18	22.8	21	21.4	Oct. 5	1.2	7	23.7	14	14.1	17	12.7
24	19.9	27	18.5	10	22.2	13	20.7	20	11.2	23	9.8
Mar. 1	17.0	Mar. 4	15.5	16	19.2	19	17.7	26	8.4	29	6.9
7	14.1	10	12.6	22	16.3	25	14.8	32	5.5		

The above times are the instants of each passage of the satellite through the apsis of its apparent orbit. The position of the satellite at any other time may be found by measuring around the orbit from the apsis last passed through, bearing in mind that the radius vector of the satellite describes equal areas in equal times.

The period of the satellite of Neptune is  $5^d 21^h.044$ .

NOTE.—In the preceding diagrams the central circle represents the planet and is on the same scale as the orbits.

## WASHINGTON MEAN TIME.

## PLANETARY CONFIGURATIONS.

d h m			°		
Jan.	0	13	-		
	1	22	-		
	2	1	32	♂ ♀ ☾	Greatest elong. E. 19 30
	2	11	-	♂ ☽	Greatest Hel. Lat. N.
	5	16	-	♂ ☽	in Perihelion.
				♂ ☽	in ☿
	7	10	-	♂	Stationary.
	10	6	-	♂	in Perihelion.
	13	3	49	♂ ☽ ☾	♂ - 2 29
	14	13	35	♂ ☽ ☾	♂ - 5 12
	16	19	-	♂ ☽ ☾	Inferior.
	16	22	25	♂ ☽ ☾	♂ - 1 23
	18	5	13	♂ ☽ ☾	♂ - 4 39
	19	23	23	♂ ☽ ☾	♂ - 3 33
	20	13	-	♂	Greatest Hel. Lat. N.
	21	16	28	♂ ☽ ☾	♂ - 1 55
	28	3	-	♂ ☽ ☾	♂ + 1 47
	28	3	-	♂	Stationary.
	29	11	34	♂ ☽ ☾	♂ + 4 2
Feb.	1	7	-	♂ ☽ ☾	Greatest elong. W. 25 52
	9	16	-		
	10	22	3	♂ ☽ ☾	♂ - 5 21
	12	10	38	♂ ☽ ☾	♂ - 4 8
	13	1	-	♂	in ☿
	13	11	20	♂ ☽ ☾	♂ - 4 35
	14	18	5	♂ ☽ ☾	♂ - 4 30
	18	1	58	♂ ☽ ☾	♂ - 1 8
	18	9	51	♂ ☽ ☾	♂ - 1 11
	23	6	-	♂	in Aphelion.
	25	12	-	♂ ☽ ☾	♂ + 0 30
	25	12	-	♂ ☽ ☾	♂ - 0 49
	25	20	30	♂ ☽ ☾	♂ + 4 11
	27	0	-	♂	in ☿
Mar.	7	10	-	♂ ☽ ☾	♂ + 0 20
	9	6	16	♂ ☽ ☾	♂ - 5 28
	13	6	39	♂ ☽ ☾	♂ - 4 23
	13	21	34	♂ ☽ ☾	♂ - 3 49
	13	22	-	♂	Stationary.
	14	15	-	♂	Greatest Hel. Lat. S.
	15	18	8	♂ ☽ ☾	♂ - 3 19
	16	-	-	☉	Ann. eclips. invis. at Wash.
	17	4	27	♂ ☽ ☾	♂ - 0 31
	18	2	21	♂ ☽ ☾	♂ + 1 20
	20	4	-	☉ ☽ ☾	
	20	8	-	☉	enters ♈, Spring com.
	23	12	-	☉ ☽ ☾	
	24	3	30	♂ ☽ ☾	♂ + 4 14
	26	4	-	♂ ☽ ☾	Superior.
	26	9	-	♂ ☽ ☾	♂ - 0 5
	26	17	-	♂ ☽ ☾	
Apr.	1	10	-	♂	in Aphelion.
	2	15	-	♂	in ☿
Apr.	3	15	-	♂	Stationary.
	5	14	43	♂ ☽ ☾	♂ - 5 27
	7	6	-	♂	in Perihelion.
	8	3	-	♂ ☽ ☾	♂ + 1 16
	9	18	41	♂ ☽ ☾	♂ - 4 15
	13	5	55	♂ ☽ ☾	♂ - 1 16
	14	0	0	♂ ☽ ☾	♂ + 0 7
	16	1	18	♂ ☽ ☾	♂ + 3 24
	16	16	13	♂ ☽ ☾	♂ + 6 29
	17	13	-	♂	Greatest Hel. Lat. N.
	20	9	38	♂ ☽ ☾	♂ + 4 9
	21	4	-	♂	Greatest elong. E. 20 12
	22	17	-	♂ ☽ ☾	♂ - 0 30
	22	22	-	♂	in ☿
	23	20	-	♂	Greatest Hel. Lat. S.
	30	0	-	♂	Greatest Hel. Lat. S.
May	2	4	-	♂	Stationary.
	2	23	3	♂ ☽ ☾	♂ - 5 20
	7	5	33	♂ ☽ ☾	♂ - 4 3
	9	5	-	♂ ☽ ☾	♂ + 0 21
	11	0	-	♂	in ☿
	11	3	-	☉ ☽ ☾	
	11	19	51	♂ ☽ ☾	♂ + 0 44
	12	18	-	♂ ☽ ☾	Inferior.
	13	10	49	♂ ☽ ☾	♂ + 2 12
	14	10	59	♂ ☽ ☾	♂ + 3 15
	14	23	17	♂ ☽ ☾	♂ + 4 49
	17	16	46	♂ ☽ ☾	♂ + 4 1
	21	5	-	♂	in Aphelion.
	21	22	-	♂ ☽ ☾	♂ - 1 53
	25	0	-	♂	Stationary.
	30	0	-	♂ ☽ ☾	
	30	6	20	♂ ☽ ☾	♂ - 5 13
	31	20	-	♂	Stationary.
June	1	7	-	♂	in Perihelion.
	3	14	24	♂ ☽ ☾	♂ - 3 52
	8	4	-	♂	Greatest elong. W. 23 46
	8	14	54	♂ ☽ ☾	♂ + 1 20
	10	14	-	♂	Greatest Hel. Lat. S.
	11	7	42	♂ ☽ ☾	♂ + 1 18
	12	14	21	♂ ☽ ☾	♂ + 4 43
	12	20	22	♂ ☽ ☾	♂ + 5 31
	14	2	2	♂ ☽ ☾	♂ + 3 54
	18	13	-	♂ ☽ ☾	♂ - 0 35
	19	0	-	♂ ☽ ☾	
	19	3	-	♂	in ☿
	21	4	-	☉	enters ♊, Summer com.
	26	11	58	♂ ☽ ☾	♂ - 5 12
	27	2	-	♂ ☽ ☾	
	29	11	-	♂ ☽ ☾	♂ + 1 24
	29	15	-	♂	in ☿

## WASHINGTON MEAN TIME.

## PLANETARY CONFIGURATIONS.

d	h	m		°			d	h	m		°		
June 30	20	37	♂ ♃ ☾	♂ - 3	47		Oct. 1	3	-	♂	Greatest elong. W.	17	54
July 1	20	-	♂ ♃ ☾	♂ - 0	16		1	19	48	♂ ☾ ☾	♂ + 3	57	
3	23	-	♂ ♃ ☾	♂ + 1	45		5	18	1	♂ ☾ ☾	♂ + 2	49	
4	5	-	♂ ☾ ☾	♂			7	9	55	♂ ☾ ☾	♂ + 1	2	
4	8	-	♂ ☾ ☾	♂			8	16	-	♂ ☾ ☾	♂		
6	7	37	♂ ☾ ☾	♂ + 1	49		10	5	36	♂ ☾ ☾	♂ - 4	27	
7	14	-	♂ ☾ ☾ Superior.				10	11	-	♂	Greatest Hel. Lat. N.		
8	21	-	♂ ☾ ☾	♂ + 1	43		10	23	-	♂	Stationary.		
9	6	-	♂ ☾ ☾ Superior.				13	11	54	♂ ☾ ☾	♂ - 5	22	
9	16	-	♂ ☾ ☾	♂ + 0	43		17	10	29	♂ ☾ ☾	♂ - 4	10	
11	13	14	♂ ☾ ☾	♂ + 3	54		18	6	-	♂ ☾ ☾			
11	16	18	♂ ☾ ☾	♂ + 5	36		18	16	-	♂	Stationary.		
12	16	14	♂ ☾ ☾	♂ + 5	13		23	4	36	♂ ☾ ☾	♂ + 1	34	
12	21	42	♂ ☾ ☾	♂ + 5	56		25	4	-	♂	Greatest Hel. Lat. N.		
14	12	-	♂ ☾ ☾	♂			29	1	22	♂ ☾ ☾	♂ + 3	47	
21	10	-	♂ ☾ ☾	♂			30	17	-	♂ ☾ ☾ Superior.			
22	19	-	♂ ☾ ☾	♂			Nov. 2	23	-	♂	in ☾		
23	16	18	♂ ☾ ☾	♂ - 5	18		3	6	16	♂ ☾ ☾	♂ + 1	14	
28	0	18	♂ ☾ ☾	♂ - 3	52		6	19	-	♂ ☾ ☾	♂		
Aug. 2	20	9	♂ ☾ ☾	♂ + 2	6		7	3	58	♂ ☾ ☾	♂ - 5	7	
6	23	-	♂ ☾ ☾	♂			9	8	9	♂ ☾ ☾	♂ - 6	31	
8	1	2	♂ ☾ ☾	♂ + 3	58		9	23	36	♂ ☾ ☾	♂ - 5	11	
9	10	45	♂ ☾ ☾	♂ + 5	8		12	3	-	♂	in Aphelion.		
10	1	-	♂ ☾ ☾	♂			13	4	-	♂	in Aphelion.		
11	14	12	♂ ☾ ☾	♂ + 3	20		13	19	8	♂ ☾ ☾	♂ - 3	53	
12	16	17	♂ ☾ ☾	♂ - 0	44		16	10	-	♂ ☾ ☾	♂ - 1	28	
13	15	-	♂ ☾ ☾	♂			19	5	53	♂ ☾ ☾	♂ + 1	31	
17	5	-	♂ ☾ ☾	♂			25	6	12	♂ ☾ ☾	♂ + 3	36	
19	12	-	♂ ☾ ☾	♂			29	9	-	♂	in Aphelion.		
19	20	40	♂ ☾ ☾	♂ - 5	25		Dec. 1	16	1	♂ ☾ ☾	♂ - 0	22	
19	23	-	♂ ☾ ☾	♂			3	5	-	♂ ☾ ☾	♂ - 2	10	
24	2	35	♂ ☾ ☾	♂ - 4	4		3	13	-	♂	Greatest Hel. Lat. S.		
30	3	11	♂ ☾ ☾	♂ + 2	7		4	13	-	♂	Greatest Hel. Lat. S.		
Sept. 1	15	-	♂ ☾ ☾	♂			7	12	16	♂ ☾ ☾	♂ - 5	2	
4	7	-	♂ ☾ ☾	♂			8	0	19	♂ ☾ ☾	♂ - 6	56	
4	11	42	♂ ☾ ☾	♂ + 4	0		9	16	0	♂ ☾ ☾	♂ - 5	49	
4	18	-	♂ ☾ ☾	♂ - 5	57		11	7	1	♂ ☾ ☾	♂ - 3	28	
6	14	-	♂ ☾ ☾	♂			13	16	-	♂	Greatest elong. E.	20	30
7	3	26	♂ ☾ ☾	♂ + 4	10		15	17	-	♂	Stationary.		
9	-	-	♂ ☾ ☾	♂			16	11	43	♂ ☾ ☾	♂ + 1	47	
9	18	27	♂ ☾ ☾	♂ - 5	19		21	12	-	♂	Stationary.		
10	9	9	♂ ☾ ☾	♂ - 0	30		21	13	-	♂	enters ♄, Winter com.		
15	9	-	♂ ☾ ☾	♂			21	16	-	♂ ☾ ☾	♂		
16	2	49	♂ ☾ ☾	♂ - 5	28		22	12	29	♂ ☾ ☾	♂ + 3	32	
18	17	-	♂ ☾ ☾	♂			22	13	-	♂	in ☾		
20	5	20	♂ ☾ ☾	♂ - 4	13		27	4	-	♂	in Perihelion.		
22	19	-	♂ ☾ ☾	♂			27	16	-	♂ ☾ ☾	♂ - 0	48	
23	19	-	♂ ☾ ☾	♂			28	5	-	♂ ☾ ☾	♂		
25	14	-	♂ ☾ ☾	♂			29	23	25	♂ ☾ ☾	♂ - 1	45	
26	5	3	♂ ☾ ☾	♂ + 1	52		30	22	-	♂ ☾ ☾	♂		
30	4	-	♂ ☾ ☾	♂			31	12	-	♂ ☾ ☾	♂		
Oct. 1	2	-	♂ ☾ ☾	♂						♂ ☾ ☾	♂		

## POSITIONS OF OBSERVATORIES.

*(North Latitudes and West Longitudes are Considered Positive.)*

Place.	Latitude.	Reduction to Geocentric Latitude.	Log $\rho$ .	Longitude.	
				From Washington.	From Greenwich.
	° ' "	' "		h m s	h m s
Abastuman . . .	+ 41 42 24	- 11 35.5	9.999 351	- 7 59 41	- 2 51 25
Åbo . . .	+ 60 26 56.8	- 10 2.1	9.998 887	- 6 37 22.20	- 1 29 6.42
Adelaide . . .	- 34 55 38.5	+ 10 56.8	9.999 520	+ 9 37 23.92	- 9 14 20.30
Albany ( <i>New Obs.</i> ) . .	+ 42 39 12.7	- 11 38.0	9.999 326	- 0 13 9.0	+ 4 55 6.8
Albany ( <i>Old Obs.</i> ) . .	+ 42 39 49.5	- 11 38.0	9.999 326	- 0 13 15.79	+ 4 54 59.99
Alfred ( <i>N. Y.</i> ) . . .	+ 42 15 19.8	- 11 37.0	9.999 337	+ 0 2 51.37	+ 5 11 7.15
Algiers ( <i>Old Obs.</i> ) . .	+ 36 44 0	- 11 10.8	9.999 476	- 5 20 32.6	- 0 12 16.8
Algiers ( <i>New Obs.</i> ) . .	+ 36 47 50	- 11 11.3	9.999 474	- 5 20 24.33	- 0 12 8.55
Allegheny . . .	+ 40 27 41.6	- 11 31.3	9.999 383	+ 0 11 47.15	+ 5 20 2.93
Altona . . .	+ 53 32 45 3	- 11 10.2	9.999 049	- 5 48 2.02	- 0 39 46.24
Amherst . . .	+ 42 22 17.1	- 11 37.3	9.999 334	- 0 18 11.11	+ 4 50 4.67
Annapolis . . .	+ 38 58 53.5	- 11 24.5	9.999 420	- 0 2 19.29	+ 5 5 56.49
Ann Arbor . . .	+ 42 16 48.0	- 11 37.0	9.999 336	+ 0 26 39.41	+ 5 34 55.19
Arequipa ( <i>Harvard</i> ) . .	- 16 24	+ 6 18.4	9.999 884	- 0 22 46	+ 4 45 30
Armagh . . .	+ 54 21 12.7	- 11 4.2	9.999 029	- 4 41 40.4	+ 0 26 35.4
Athens . . .	+ 37 58 20.7	- 11 18.9	9.999 445	- 6 43 8.70	- 1 34 52.92
Bamberg . . .	+ 49 53 6.0	- 11 30.7	9.999 141	- 5 51 49.43	- 0 43 33.65
Beloit . . .	+ 42 30 8.4	- 11 37.6	9.999 331	+ 0 47 51.5	+ 5 56 7.3
Bergen . . .	+ 60 23 54	- 10 2.7	9.998 888	- 5 29 28.53	- 0 21 12.75
Berkeley . . .	+ 37 52 23.6	- 11 18.3	9.999 448	+ 3 0 46.94	+ 8 9 2.72
Berlin . . .	+ 52 30 16.7	- 11 17.1	9.999 075	- 6 1 50.63	- 0 53 34.85
Berlin ( <i>Urania</i> ) . . .	+ 52 31 30.7	- 11 17.0	9.999 075	- 6 1 43.23	- 0 53 27.45
Berne . . .	+ 46 57 8.7	- 11 39.0	9.999 216	- 5 38 1.51	- 0 29 45.73
Besançon . . .	+ 47 14 59.0	- 11 38.5	9.999 208	- 5 32 12.95	- 0 23 57.17
Bethlehem . . .	+ 40 36 23.1	- 11 31.9	9.999 379	- 0 6 43.93	+ 5 1 31.85
Birr Castle . . .	+ 53 5 47.0	- 11 13.3	9.999 060	- 4 36 34.9	+ 0 31 40.9
Bogota . . .	+ 4 36 15.4	- 1 51.5	9.999 991	- 0 11 21.58	+ 4 56 54.20
Bologna . . .	+ 44 29 54	- 11 40.3	9.999 279	- 5 53 40.7	- 0 45 24.9
Bombay . . .	+ 18 53 45	- 7 8.1	9.999 847	- 9 59 31.52	- 4 51 15.74
Bonn . . .	+ 50 43 45.0	- 11 26.9	9.999 120	- 5 36 39.00	- 0 28 23.22
Bordeaux . . .	+ 44 50 7.2	- 11 40.4	9.999 271	- 5 6 10.24	+ 0 2 5.54
Boston ( <i>University</i> ) . .	+ 42 21 32.5	- 11 37.2	9.999 334	- 0 24 0.8	+ 4 44 15.0
Bothkamp . . .	+ 54 12 9.6	- 11 5.3	9.999 033	- 5 48 47.0	- 0 40 31.2
Breslau . . .	+ 51 6 55.8	- 11 25.0	9.999 110	- 6 16 24.57	- 1 8 8.79
Brisbane . . .	- 27 28 0.0	+ 9 32.2	9.999 689	+ 8 39 37.82	- 10 12 6.40
Brussels ( <i>Uccle</i> ) . . .	+ 50 47 53	- 11 26.6	9.999 118	- 5 25 42.7	- 0 17 26.9
Brussels ( <i>Old Obs.</i> ) . .	+ 50 51 10.7	- 11 26.3	9.999 117	- 5 25 44.51	- 0 17 28.73
Budapest . . .	+ 47 29 34.7	- 11 38.0	9.999 202	- 6 24 31.1	- 1 16 15.3
Cairo . . .	+ 30 4 38.2	- 10 6.5	9.999 632	- 7 13 24.69	- 2 5 8.91
Cambridge ( <i>England</i> ) . .	+ 52 12 51.6	- 11 18.9	9.999 082	- 5 8 38.53	- 0 0 22.75
Cambridge ( <i>Mass.</i> ) . .	+ 42 22 47.6	- 11 37.3	9.999 334	- 0 23 44.73	+ 4 44 31.05
Cape of Good Hope . .	- 33 56 3.6	+ 10 48.0	9.999 543	- 6 22 10.54	- 1 13 54.76
Catania . . .	+ 37 30 13.3	- 11 16.0	9.999 457	- 6 8 36	- 1 0 20
Chapultepec . . .	+ 19 25 17.5	- 7 18.2	9.999 838	+ 1 28 22.52	+ 6 36 38.30
Charkow . . .	+ 50 0 9.6	- 11 30.2	9.999 138	- 7 33 11.55	- 2 24 55.77



## POSITIONS OF OBSERVATORIES.

(North Latitudes and West Longitudes are Considered Positive.)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log $\rho$ .	Longitude.	
				From Washington.	From Greenwich.
	° ' "	' "		h m s	h m s
Charlottesville	+ 38 2 1.2	- 11 19.3	9.999 444	+ 0 5 49.44	+ 5 14 5.22
Chicago ( <i>Old Obs.</i> )	+ 41 50 1.0	- 11 35.9	9.999 348	+ 0 42 11.06	+ 5 50 26.84
Christiania	+ 59 54 44.0	- 10 8.7	9.998 899	- 5 51 9.30	- 0 42 53.52
Cincinnati ( <i>New Obs.</i> )	+ 39 8 19.5	- 11 25.4	9.999 416	+ 0 29 25.62	+ 5 37 41.40
Cincinnati ( <i>Old Obs.</i> )	+ 39 6 26.5	- 11 25.2	9.999 417	+ 0 29 43.22	+ 5 37 59.00
Clinton	+ 43 3 17.0	- 11 38.7	9.999 316	- 0 6 38.33	+ 5 1 37.45
Coimbra	+ 40 12 24.5	- 11 30.3	9.999 389	- 4 34 32.7	+ 0 33 43.1
Columbia ( <i>Missouri</i> )	+ 38 56 51.7	- 11 24.4	9.999 421	+ 1 1 2.55	+ 6 9 18.33
Copenhagen	+ 55 41 12.9	- 10 53.1	9.998 997	- 5 58 34.48	- 0 50 18.70
Cordoba	- 31 25 15.2	+ 10 22.2	9.999 602	- 0 51 27.56	+ 4 16 48.22
Cracow	+ 50 3 52.0	- 11 29.9	9.999 137	- 6 28 6.06	- 1 19 50.28
Crowborough	+ 51 3 14	- 11 25.4	9.999 112	- 5 8 54	- 0 0 38
Dantzic	+ 54 21 18.0	- 11 4.1	9.999 029	- 6 22 55.4	- 1 14 39.6
Denver	+ 39 40 36.4	- 11 27.9	9.999 402	+ 1 51 31.85	+ 6 59 47.63
Dorpat	+ 58 22 47.1	- 10 26.4	9.998 934	- 6 55 9.07	- 1 46 53.29
Dresden	+ 51 2 16.8	- 11 25.4	9.999 112	- 6 3 10.63	- 0 54 54.85
Dublin	+ 53 23 13.1	- 11 11.3	9.999 053	- 4 42 54.7	+ 0 25 21.1
Dun Echt	+ 57 9 36	- 10 39.2	9.998 962	- 4 58 35.8	+ 0 9 40.0
Durham	+ 54 46 6.2	- 11 0.9	9.999 019	- 5 1 56.03	+ 0 6 19.75
Düsseldorf	+ 51 12 25.0	- 11 24.6	9.999 108	- 5 35 20.8	- 0 27 5.0
Edinburgh ( <i>Calton Hill</i> )	+ 55 57 23.2	- 10 50.7	9.998 991	- 4 55 32.7	+ 0 12 43.1
Edinburgh ( <i>Royal Obs.</i> )	+ 55 55 28.0	- 10 50.9	9.998 991	- 4 55 31.6	+ 0 12 44.2
Evanston ( <i>Dearborn</i> )	+ 42 3 33.4	- 11 36.5	9.990 342	+ 0 42 26.5	+ 5 50 42.3
Florence ( <i>Reale Museo</i> )	+ 43 46 4.1	- 11 39.7	9.999 298	- 5 53 17.3	- 0 45 1.5
Florence ( <i>Arcetri</i> )	+ 43 45 14.6	- 11 39.7	9.999 298	- 5 53 17.12	- 0 45 1.34
Geneva	+ 46 11 58.8	- 11 39.9	9.999 236	- 5 32 52.49	- 0 24 36.71
Genoa	+ 44 25 9.3	- 11 40.2	9.999 281	- 5 43 57.11	- 0 35 41.33
Georgetown	+ 38 54 26.7	- 11 24.2	9.999 422	+ 0 0 2.48	+ 5 8 18.26
Glasgow ( <i>Missouri</i> )	+ 39 13 45.6	- 11 25.8	9.999 414	+ 1 3 2.30	+ 6 11 18.08
Glasgow ( <i>Scotland</i> )	+ 55 52 42.8	- 10 51.5	9.998 993	- 4 51 5.23	+ 0 17 10.55
Gohlis	+ 51 21 35.0	- 11 23.7	9.999 104	- 5 57 45.43	- 0 49 29.65
Gotha ( <i>Old Obs.</i> )	+ 50 56 5.2	- 11 26.0	9.999 114	- 5 51 10.88	- 0 42 55.10
Gotha	+ 50 56 37.9	- 11 25.9	9.999 114	- 5 51 6.27	- 0 42 50.49
Göttingen	+ 51 31 47.9	- 11 22.8	9.999 100	- 5 48 2.07	- 0 39 46.29
Graz	+ 47 4 37.2	- 11 38.8	9.999 213	- 6 10 4	- 1 1 48
Greenwich	+ 51 28 38.1	- 11 23.1	9.999 101	- 5 8 15.78	0 0 0.00
Grignon	+ 47 33 42	- 11 37.8	9.999 201	- 5 25 54	- 0 17 38
Hamburg	+ 53 33 7.0	- 11 10.1	9.999 049	- 5 48 9.6	- 0 39 53.8
Hanover	+ 43 42 15.3	- 11 39.6	9.999 300	- 0 19 7.87	+ 4 49 7.91
Harrow	+ 51 34 47.1	- 11 22.6	9.999 098	- 5 6 55.92	+ 0 1 19.86
Hastings-on-Hudson	+ 40 59 25	- 11 33.2	9.999 369	- 0 12 46.33	+ 4 55 29.45
Haverford	+ 40 0 40.1	- 11 29.4	9.999 394	- 0 7 3.08	+ 5 1 12.70
Heidelberg	+ 49 24 35	- 11 32.5	9.999 153	- 5 43 4.3	- 0 34 48.5
Helsingfors	+ 60 9 42.6	- 10 5.6	9.998 893	- 6 48 4.93	- 1 39 49.15
Herény	+ 47 15 47.4	- 11 38.4	9.999 208	- 6 14 40.5	- 1 6 24.7

POSITIONS OF OBSERVATORIES.					
(North Latitudes and West Longitudes are Considered Positive.)					
Place.	Latitude.	Reduction to Geocentric Latitude.	Log $\rho$ .	Longitude.	
				From Washington.	From Greenwich.
	° ' "	' "		h m s	h m s
Hongkong . . . . .	+ 22 18 13.4	- 8 10.7	9.999 789	+ 11 15 2.36	- 7 36 41.86
Hudson . . . . .	+ 41 14 42.6	- 11 34.1	9.999 363	+ 0 17 25.5	+ 5 25 41.3
Jamaica . . . . .	+ 18 24 51	- 6 58.7	9.999 854	+ 0 3 13.70	+ 5 11 29.48
Jena ( <i>University</i> ) . . . . .	+ 50 55 34.9	- 11 26.0	9.999 115	- 5 54 36.05	- 0 46 20.27
Kalocsa . . . . .	+ 46 31 41.7	- 11 39.6	9.999 227	- 6 24 10.12	- 1 15 54.34
Karlsruhe . . . . .	+ 49 0 29.6	- 11 33.9	9.999 163	- 5 41 52.2	- 0 33 36.4
Kasan . . . . .	+ 55 47 24.4	- 10 52.2	9.998 995	- 8 24 44.82	- 3 16 29.04
Kew . . . . .	+ 51 28 6	- 11 23.2	9.999 101	- 5 7 0.7	+ 0 1 15.1
Kiel . . . . .	+ 54 20 28.5	- 11 4.2	9.999 030	- 5 48 51.42	- 0 40 35.64
Kiew . . . . .	+ 50 27 10.5	- 11 28.2	9.999 127	- 7 10 16.42	- 2 2 0.64
Kis Kartal . . . . .	+ 47 41 54.8	- 11 37.5	9.999 197	- 6 26 27.5	- 1 18 11.7
Königsberg . . . . .	+ 54 42 50.4	- 11 1.3	9.999 021	- 6 30 14.82	- 1 21 59.04
Kremsmünster . . . . .	+ 48 3 23.1	- 11 36.7	9.999 188	- 6 4 47.37	- 0 56 31.59
La Plata . . . . .	- 34 54 30.3	+ 10 56.7	9.999 520	- 1 16 38.8	+ 3 51 37.0
Leiden . . . . .	+ 52 9 20.0	- 11 19.3	9.999 084	- 5 26 11.95	- 0 17 56.17
Leipzig . . . . .	+ 51 20 5.9	- 11 23.9	9.999 104	- 5 57 49.76	- 0 49 33.98
Liege ( <i>Cointe, Ougrée</i> ) . . . . .	+ 50 37 7	- 11 27.5	9.999 123	- 5 30 31.0	- 0 22 15.2
Lisbon ( <i>Marine Obs.</i> ) . . . . .	+ 38 42 17.6	- 11 23.3	9.999 427	- 4 31 42.20	+ 0 36 33.58
Lisbon ( <i>Royal Obs.</i> ) . . . . .	+ 38 42 31.3	- 11 23.1	9.999 427	- 4 31 31.10	+ 0 36 44.68
Liverpool . . . . .	+ 53 24 4.8	- 11 11.2	9.999 053	- 4 55 58.45	+ 0 12 17.33
Lübec . . . . .	+ 53 51 31.1	- 11 7.9	9.999 042	- 5 51 1.5	- 0 42 45.7
Lund . . . . .	+ 55 41 51.6	- 10 53.0	9.998 997	- 6 1 0.79	- 0 52 45.01
Lussinpiccolo ( <i>Manora</i> ) . . . . .	+ 44 32 11.0	- 11 40.3	9.999 278	- 6 6 8.19	- 0 57 52.41
Lyons . . . . .	+ 45 41 41.0	- 11 40.3	9.999 248	- 5 27 24.33	- 0 19 8.55
Madison . . . . .	+ 43 4 36.8	- 11 38.7	9.999 316	+ 0 49 22.15	+ 5 57 37.93
Madras . . . . .	+ 13 4 8.0	- 5 7.6	9.999 925	- 10 29 14.90	- 5 20 59.12
Madrid . . . . .	+ 40 24 29.7	- 11 31.1	9.999 384	- 4 53 30.66	+ 0 14 45.12
Manila . . . . .	+ 14 35 25	- 5 40.5	9.999 907	+ 10 47 54	- 8 3 50
Mannheim . . . . .	+ 49 29 11.0	- 11 32.2	9.999 151	- 5 42 6.23	- 0 33 50.45
Marburg . . . . .	+ 50 48 46.9	- 11 26.5	9.999 118	- 5 43 20.7	- 0 35 4.9
Markree . . . . .	+ 54 10 31.8	- 11 5.5	9.999 034	- 4 34 27.4	+ 0 33 48.4
Marseilles . . . . .	+ 43 18 17.5	- 11 39.1	9.999 310	- 5 29 50.37	- 0 21 34.59
Mauritius . . . . .	- 20 5 39	+ 7 30.8	9.999 828	- 8 58 28.4	- 3 50 12.6
Melbourne . . . . .	- 37 49 53.4	+ 11 18.1	9.999 449	+ 9 11 50.2	- 9 39 54.0
Meudon . . . . .	+ 48 48 18	- 11 34.6	9.999 169	- 5 17 11.4	- 0 8 55.6
Mexico . . . . .	+ 19 26 1.3	- 7 18.4	9.999 838	+ 1 28 10.95	+ 6 36 26.73
Middletown ( <i>Conn.</i> ) . . . . .	+ 41 33 16.0	- 11 35.1	9.999 355	- 0 17 38.60	+ 4 50 37.18
Milan . . . . .	+ 45 27 59.3	- 11 40.4	9.999 254	- 5 45 1.70	- 0 36 45.92
Modena . . . . .	+ 44 38 52.8	- 11 40.4	9.999 275	- 5 51 58.7	- 0 43 42.9
Moncalieri . . . . .	+ 44 59 51	- 11 40.4	9.999 266	- 5 39 5	- 0 30 49
Montreal . . . . .	+ 45 30 17.0	- 11 40.4	9.999 253	- 0 13 57.15	+ 4 54 18.63
Montsouris . . . . .	+ 48 49 18.0	- 11 34.5	9.999 168	- 5 17 36.46	- 0 9 20.68
Moscow . . . . .	+ 55 45 19.8	- 10 52.5	9.998 995	- 7 38 32.87	- 2 30 17.09
Mount Hamilton ( <i>Lick</i> ) . . . . .	+ 37 20 25.6	- 11 14.9	9.999 461	+ 2 58 19.11	+ 8 6 34.89
Munich . . . . .	+ 48 8 45.5	- 11 36.5	9.999 186	- 5 54 41.85	- 0 46 26.07

## POSITIONS OF OBSERVATORIES.

*(North Latitudes and West Longitudes are Considered Positive.)*

Place.	Latitude.	Reduction to Geocentric Latitude.	Log $\mu$ .	Longitude.	
				From Washington.	From Greenwich.
	° ' "	' "		h m s	h m s
Naples . . . . .	+40 51 46.3	-11 32.8	9.999 372	- 6 5 17.51	- 0 57 1.73
Nashville . . . . .	+36 8 54.4	-11 6.6	9.999 490	+ 0 38 56.4	+ 5 47 12.2
Natal . . . . .	-29 50 46.6	+10 3.7	9.999 637	- 7 12 16.96	- 2 4 1.18
Neuchatel . . . . .	+47 0 1.2	-11 38.9	9.999 215	- 5 36 5.71	- 0 27 49.93
New Haven ( <i>Old Obs.</i> )	+41 18 36.5	-11 34.3	9.999 361	- 0 16 33.64	+ 4 51 42.14
New Haven ( <i>Yale Univ.</i> )	+41 19 22.3	-11 34.4	9.999 361	- 0 16 35.20	+ 4 51 40.58
New York ( <i>Columb. Coll.</i> )	+40 45 23.1	-11 32.4	9.999 375	- 0 12 22.14	+ 4 55 53.64
New York ( <i>RUTHERFURD</i> )	+40 43 48.5	-11 32.3	9.999 376	- 0 12 19.10	+ 4 55 56.68
Nice . . . . .	+43 43 16.9	-11 39.6	9.999 299	- 5 37 27.96	- 0 29 12.18
Nicolaëff . . . . .	+46 58 21.8	-11 38.9	9.999 216	- 7 16 9.58	- 2 7 53.80
Northfield . . . . .	+44 27 41.6	-11 40.3	9.999 280	+ 1 4 20.03	+ 6 12 35.81
Oakland ( <i>Cal.</i> ) . . . . .	+37 48 5	-11 17.9	9.999 449	+ 3 0 50.77	+ 8 9 6.55
Odessa . . . . .	+46 28 36.7	-11 39.6	9.999 228	- 7 11 17.88	- 2 3 2.10
Ogden . . . . .	+41 13 8.6	-11 34.0	9.999 363	+ 2 19 43.85	+ 7 27 59.63
O-Gyalla . . . . .	+47 52 27.3	-11 37.1	9.999 192	- 6 21 1.32	- 1 12 45.54
Olmütz . . . . .	+49 35 43	-11 31.8	9.999 149	- 6 17 24	- 1 9 8
Oxford ( <i>Mississippi</i> ) . . . . .	+34 22 12.6	-10 52.0	9.999 533	+ 0 49 51.3	+ 5 58 7.1
Oxford ( <i>Radcliffe</i> ) . . . . .	+51 45 35.4	-11 21.6	9.999 094	- 5 3 13.2	+ 0 5 2.6
Oxford ( <i>University</i> ) . . . . .	+51 45 34.2	-11 21.6	9.999 094	- 5 3 15.4	+ 0 5 0.4
Padua . . . . .	+45 24 5	-11 40.4	9.999 256	- 5 55 44.97	- 0 47 29.19
Palermo . . . . .	+38 6 44.0	-11 19.7	9.999 442	- 6 1 41.68	- 0 53 25.90
Paramatta . . . . .	-33 48 49.8	+10 46.9	9.999 546	+ 8 47 44.0	-10 4 0.2
Paris . . . . .	+48 50 11.2	-11 34.5	9.999 168	- 5 17 36.75	- 0 9 20.97
Philadelphia . . . . .	+39 57 7.5	-11 29.2	9.999 396	- 0 7 37.27	+ 5 0 38.51
Plonsk . . . . .	+52 37 40.0	-11 16.4	9.999 072	- 6 29 47.8	- 1 21 32.0
Pola . . . . .	+44 51 48.7	-11 40.4	9.999 270	- 6 3 38.67	- 0 55 22.89
Portsmouth . . . . .	+50 48 3	-11 26.6	9.999 118	- 5 3 51.0	+ 0 4 24.8
Potsdam . . . . .	+52 22 56.0	-11 17.9	9.999 078	- 6 0 31.7	- 0 52 15.9
Poughkeepsie . . . . .	+41 41 18	-11 35.5	9.999 351	- 0 12 42.13	+ 4 55 33.65
Prague ( <i>University</i> ) . . . . .	+50 5 15.8	-11 29.8	9.999 136	- 6 5 56.1	- 0 57 40.3
Princeton . . . . .	+40 20 57.8	-11 30.8	9.999 385	- 0 9 38.17	+ 4 58 37.61
Princeton ( <i>Halsted</i> ) . . . . .	+40 20 55.8	-11 30.9	9.999 386	- 0 9 36.34	+ 4 58 39.44
Providence ( <i>SEAGRAVE</i> ) . . . . .	+41 49 46.4	-11 35.9	9.999 348	- 0 22 38.14	+ 4 45 37.64
Providence ( <i>Ladd</i> ) . . . . .	+41 50 21	-11 35.9	9.999 348	- 0 22 39.83	+ 4 45 35.95
Pulkowa . . . . .	+59 46 18.7	-10 10.4	9.998 902	- 7 9 34.42	- 2 1 18.64
Quebec . . . . .	+46 47 59.2	-11 39.2	9.999 220	- 0 23 23.14	+ 4 44 52.64
Quito . . . . .	- 0 14 0	+ 0 5.7	0.000 000	+ 0 5 50.88	+ 5 14 6.66
Riga . . . . .	+56 57 9.3	-10 41.3	9.998 967	- 6 44 43.95	- 1 36 28.17
Rio de Janeiro . . . . .	-22 54 23.6	+ 8 21.1	9.999 779	- 2 15 34.4	+ 2 52 41.4
Rochester . . . . .	+43 9 16.8	-11 38.8	9.999 314	+ 0 2 6.00	+ 5 10 21.78
Rome ( <i>Coll. Rom.</i> ) . . . . .	+41 53 53.6	-11 36.1	9.999 346	- 5 58 11.33	- 0 49 55.55
Rome ( <i>Capitol</i> ) . . . . .	+41 53 33.5	-11 36.0	9.999 346	- 5 58 12.15	- 0 49 56.37
Rome ( <i>Vatican</i> ) . . . . .	+41 54 4.8	-11 36.1	9.999 346	- 5 58 5.25	- 0 49 49.47
Rousdon . . . . .	+50 42 38	-11 27.0	9.999 120	- 4 56 16.84	+ 0 11 58.94
Rugby . . . . .	+52 22 7	-11 18.0	9.999 079	- 5 3 13.8	+ 0 5 2.0

## POSITIONS OF OBSERVATORIES.

(North Latitudes and West Longitudes are Considered Positive.)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log $\rho$ .	Longitude.	
				From Washington.	From Greenwich.
	° ' "	' "		h m s	h m s
San Fernando . . .	+ 36 27 42.0	- 11 8.9	9.999 483	- 4 43 26.6	+ 0 24 49.2
San Francisco . . .	+ 37 47 27.9	- 11 17.8	9.999 450	+ 3 1 27.08	+ 8 9 42.86
Santiago de Chile . . .	- 33 26 42.0	+ 10 43.4	9.999 555	- 0 25 29.56	+ 4 42 46.22
South Hadley . . .	+ 42 15 18.2	- 11 37.0	9.999 337	- 0 17 55.49	+ 4 50 20.29
Speier . . .	+ 49 18 55.2	- 11 32.9	9.999 156	- 5 42 1.34	- 0 33 45.56
St. Louis . . .	+ 38 38 3.0	- 11 22.7	9.999 429	+ 0 52 33.48	+ 6 0 49.26
St. Petersburg ( <i>Academy</i> ) . . .	+ 59 56 29.7	- 10 8.4	9.998 898	- 7 9 29.24	- 2 1 13.46
St. Petersburg ( <i>Univ.</i> ) . . .	+ 59 56 32.0	- 10 8.4	9.998 898	- 7 9 27.2	- 2 1 11.4
Stockholm . . .	+ 59 20 33.0	- 10 15.5	9.998 912	- 6 20 29.77	- 1 12 13.99
Stonyhurst . . .	+ 53 50 40	- 11 8.0	9.999 042	- 4 58 23.10	+ 0 9 52.68
Strassburg ( <i>New Obs.</i> ) . . .	+ 48 35 0.3	- 11 35.3	9.999 174	- 5 39 20.47	- 0 31 4.69
Strassburg ( <i>Old Obs.</i> ) . . .	+ 48 34 53.8	- 11 35.3	9.999 174	- 5 39 18.27	- 0 31 2.49
Sydney . . .	- 33 51 41.1	+ 10 47.3	9.999 545	+ 8 46 54.68	- 10 4 49.54
Syracuse . . .	+ 43 2 13.1	- 11 38.6	9.999 317	- 0 3 42.42	+ 5 4 33.36
Tacubaya . . .	+ 19 24 17.5	- 7 17.8	9.999 839	+ 1 28 30.75	+ 6 36 46.53
Taschkent . . .	+ 41 19 31.3	- 11 34.4	9.999 361	- 9 45 26.58	- 4 37 10.80
Tokio . . .	+ 35 39 17.5	- 11 2.8	9.999 502	+ 9 32 46.20	- 9 18 58.02
Toronto . . .	+ 43 39 35.9	- 11 39.6	9.999 301	+ 0 9 18.87	+ 5 17 34.65
Toulouse . . .	+ 43 36 45	- 11 39.5	9.999 302	- 5 14 5.66	- 0 5 49.88
Trieste . . .	+ 45 38 45.4	- 11 40.3	9.999 250	- 6 3 18.73	- 0 55 2.95
Troy ( <i>N. Y.</i> ) . . .	+ 42 43 52.9	- 11 38.1	9.999 325	- 0 13 33.49	+ 4 54 42.29
Tulse Hill . . .	+ 51 26 47.0	- 11 23.3	9.999 102	- 5 7 48.1	+ 0 0 27.7
Turin . . .	+ 45 4 8.0	- 11 40.4	9.999 265	- 5 39 2.96	- 0 30 47.18
Tuscaloosa ( <i>Ala. Univ.</i> ) . . .	+ 33 12 36.8	- 10 41.1	9.999 561	+ 0 41 55.96	+ 5 50 11.74
Twickenham . . .	+ 51 27 4.2	- 11 23.3	9.999 102	- 5 7 2.7	+ 0 1 13.1
Upsala ( <i>New Obs.</i> ) . . .	+ 59 51 29.4	- 10 9.3	9.998 900	- 6 18 45.93	- 1 10 30.15
Utrecht . . .	+ 52 5 9.6	- 11 19.7	9.999 086	- 5 28 46.8	- 0 20 31.0
Venice . . .	+ 45 26 10.5	- 11 40.4	9.999 255	- 5 57 37.90	- 0 49 22.12
Vienna ( <i>Josephstadt</i> ) . . .	+ 48 12 53.8	- 11 36.2	9.999 183	- 6 13 41.1	- 1 5 25.3
Vienna ( <i>New Obs.</i> ) . . .	+ 48 13 55.4	- 11 36.2	9.999 183	- 6 13 37.17	- 1 5 21.39
Vienna ( <i>Old Obs.</i> ) . . .	+ 48 12 35.5	- 11 36.3	9.999 184	- 6 13 47.42	- 1 5 31 64
Vienna ( <i>Ottakring</i> ) . . .	+ 48 12 46.7	- 11 36.2	9.999 183	- 6 13 26.89	- 1 5 11.11
Warsaw . . .	+ 52 13 4.7	- 11 18.9	9.999 082	- 6 32 23.06	- 1 24 7.28
Washington . . .	+ 38 55 14.0	- 11 24.2	9.999 422	0 0 0.00	+ 5 8 15.78
Washington ( <i>Old Obs.</i> ) . . .	+ 38 53 38.8	- 11 24.1	9.999 422	- 0 0 3.63	+ 5 8 12.15
Washington ( <i>Smithsonian</i> ) . . .	+ 38 53 17.3	- 11 24.1	9.999 422	- 0 0 9.6	+ 5 8 6.2
Washington ( <i>Cath. Univ.</i> ) . . .	+ 38 56 14.8	- 11 24.2	9.999 422	- 0 0 15.78	+ 5 8 0.00
Wellington . . .	- 41 18 0.6	+ 11 34.3	9.999 361	+ 7 12 37.70	- 11 39 6 52
West Point ( <i>Old Obs.</i> ) . . .	+ 41 23 31	- 11 34.6	9.999 359	- 0 12 26.34	+ 4 55 49.44
West Point ( <i>New Obs.</i> ) . . .	+ 41 23 22.1	- 11 34.6	9.999 359	- 0 12 25.23	+ 4 55 50.55
Wilhelmshaven . . .	+ 53 31 52.2	- 11 10.3	9.999 050	- 5 40 50.89	- 0 32 35.11
Williamstown ( <i>Mass.</i> ) . . .	+ 42 42 30	- 11 38.0	9.999 325	- 0 15 26	+ 4 52 50
Williamstown ( <i>Victoria</i> ) . . .	- 37 52 7.2	+ 11 18.3	9.999 448	+ 9 12 6.1	- 9 39 38.1
Wilna . . .	+ 54 40 59.1	- 11 1.6	9.999 021	- 6 49 24.60	- 1 41 8.82
Windsor . . .	- 33 36 30.8	+ 10 44.9	9.999 551	+ 8 48 23.7	- 10 3 20.5
Zürich . . .	+ 47 22 40.0	- 11 38.2	9.999 205	- 5 42 28.08	- 0 34 12.30

## PART IV.

---

APPARENT PLACES OF STARS, STAR-NUMBERS,  
AND OTHER DATA,

BASED ON THE CONSTANTS OF THE  
PARIS CONFERENCE OF 1896.

FORMULÆ FOR THE REDUCTION OF THE POSITIONS OF THE FIXED STARS, USING THE NOTATION OF BESSEL, AND THE CONSTANTS OF THE PARIS CONFERENCE, OF MAY, 1896.

NOTATION.

- $\tau$ , the time reckoned in units of one year, from the beginning of the Besselian fictitious year, (1904, January 1<sup>st</sup>.068, Washington mean time),  
 $a_0, \delta_0$ , the star's mean right ascension and declination at the beginning of the fictitious year,  
 $\alpha, \delta$ , the star's apparent right ascension and declination at the time  $\tau$ ,  
 $\mu, \mu'$ , the annual proper motion in right ascension and declination,  
 $\odot$ , the Sun's true longitude,  
 $L$ , the Sun's mean longitude,  
 $\Omega$ , the longitude of the Moon's ascending node, |  $\omega$ , the obliquity of the ecliptic,  
 $\Gamma'$ , the longitude of the Moon's perigee,  
 $\mathcal{Q}$ , the Moon's mean longitude.

BESSELIAN STAR-NUMBERS.

$$\begin{aligned} A &= \tau - 0.34216 \sin \Omega & + 0.00024 \sin (\mathcal{Q} + \Gamma') \\ &+ 0.00415 \sin 2\Omega & + 0.00133 \sin (\mathcal{Q} - \Gamma') \\ &- 0.02495 \sin 2L & - 0.00068 \sin (2\mathcal{Q} - \Omega) \\ &+ 0.00218 \sin (L + 75^\circ.3) & - 0.00052 \sin (3\mathcal{Q} - \Gamma') \\ &- 0.00097 \sin (3L + 78^\circ.7) & + 0.00030 \sin (\mathcal{Q} - 2L + \Gamma') \\ &+ 0.00024 \sin (2L - \Omega) & + 0.00012 \sin 2(\mathcal{Q} - L) \\ &- 0.00405 \sin 2\mathcal{Q} & \\ B &= -9.210 \cos \Omega & + 0.007 \cos (2L - \Omega) \\ &+ 0.090 \cos 2\Omega & - 0.088 \cos 2\mathcal{Q} \\ &- 0.546 \cos 2L & - 0.018 \cos (2\mathcal{Q} - \Omega) \\ &- 0.021 \cos (3L + 78^\circ.7) & - 0.011 \cos (3\mathcal{Q} - \Gamma') \\ &+ 0.009 \cos (L - 78^\circ.7) & + 0.005 \cos (\mathcal{Q} + \Gamma') \\ C &= -20.4700 \cos \omega \cos \odot \\ D &= -20.4700 \sin \odot \\ E &= -0.0424 \sin \Omega + 0''.0005 \sin 2\Omega - 0''.0031 \sin 2L \end{aligned}$$

BESSEL'S Star-Constants.

$$\begin{aligned} a &= 3''.07241 + 1''.33644 \sin a_0 \tan \delta_0 = \text{precession in right ascension} \\ b &= \frac{1}{15} \cos a_0 \tan \delta_0 \\ c &= \frac{1}{15} \cos a_0 \sec \delta_0 \\ d &= \frac{1}{15} \sin a_0 \sec \delta_0 \\ a' &= 20''.0465 \cos a_0 = \text{precession in declination} \\ b' &= -\sin a_0 \\ c' &= \tan \omega \cos \delta_0 - \sin a_0 \sin \delta_0 \\ d' &= \cos a_0 \sin \delta_0 \end{aligned}$$

Reduction to Apparent Position.

$$\begin{aligned} \alpha &= a_0 + \tau \mu + Aa + Bb + Cc + Dd + \frac{1}{15} E & (\text{in time}) \\ \delta &= \delta_0 + \tau \mu' + Aa' + Bb' + Cc' + Dd' & (\text{in arc}) \end{aligned}$$

INDEPENDENT STAR-NUMBERS.

$$\begin{aligned} f &= f' + f'' = +46''.0861 A + E \text{ (in arc)} = 3''.07241 A + \frac{1}{15} E & (\text{in time}) \\ f' &= -0''.0124 \sin 2(\mathcal{Q} + 0^\circ.0041 \sin (\mathcal{Q} - \Gamma') + 0''.0007 \sin (\mathcal{Q} + \Gamma')) \\ &- 0''.0021 \sin (2\mathcal{Q} - \Omega) - 0''.0016 \sin (3\mathcal{Q} - \Gamma') \\ &+ 0''.0009 \sin (\mathcal{Q} - 2L + \Gamma') + 0''.0004 \sin 2(\mathcal{Q} - L) \\ g \sin G &= B & h \sin H &= C \\ g \cos G &= 20''.0465 A & h \cos H &= D & i &= C \tan \omega \end{aligned}$$

Reduction to Apparent Position.

$$\begin{aligned} \alpha &= a_0 + f + \tau \mu + \frac{1}{15} g \sin (G + a_0) \tan \delta_0 + \frac{1}{15} h \sin (H + a_0) \sec \delta_0 & (\text{in time}) \\ \delta &= \delta_0 + \tau \mu' + g \cos (G + a_0) + h \cos (H + a_0) \sin \delta_0 + i \cos \delta_0 & (\text{in arc}) \end{aligned}$$

NOTES.—(1) The independent star-numbers are more convenient, when only one or two apparent positions of a star are required, or when BESSEL'S star-constants are not known with sufficient accuracy. Otherwise, the Besselian star-numbers are more convenient.

(2) In using the star-constants of the *British Association Catalogue*,  $a, b, c, d, a', b', c', d'$ , with the star-numbers of this Ephemeris, the quantities to be formed are  $Ac, Bd, Ca, Db, -Ac', -Bd', -Ca', -Db'$ .

(CONSTANTS OF PARIS CONFERENCE.)

## FOR GREENWICH MEAN NOON.

Date.	Precession in Longitude from 1904.0.	Nutation.			Obliquity of Ecliptic. (Newcomb.)	The Sun's Aberration.
		In Longitude.	In R. A.	In Obliquity.		
	"	"	"	"	"	"
Jan. 1	— 0.04	+ 0.99	+ 0.060	— 9.83	23 26 56.56	— 20.81
11	+ 1.34	1.23	0.075	9.73	56.65	20.81
21	2.71	1.38	0.084	9.58	56.78	20.80
31	4.09	1.40	0.086	9.40	56.95	20.77
Feb. 10	5.46	1.25	0.076	9.21	57.13	20.73
20	+ 6.84	+ 0.95	+ 0.058	— 9.02	23 26 57.30	— 20.69
Mar. 1	8.22	+ 0.50	+ 0.031	8.87	57.44	20.64
11	9.59	— 0.04	— 0.002	8.78	57.52	20.59
21	10.97	0.63	0.038	8.74	57.55	20.53
31	12.34	1.23	0.075	8.78	57.50	20.47
Apr. 10	+ 13.72	— 1.76	— 0.108	— 8.86	23 26 57.40	— 20.42
20	15.09	2.18	0.133	9.00	57.25	20.36
30	16.47	2.51	0.153	9.16	57.07	20.30
May 10	17.85	2.69	0.164	9.34	56.89	20.26
20	19.22	2.73	0.167	9.50	56.71	20.22
30	+ 20.60	— 2.66	— 0.163	— 9.63	23 26 56.57	— 20.18
June 9	21.97	2.50	0.153	9.73	56.45	20.15
19	23.35	2.28	0.139	9.76	56.41	20.14
29	24.72	2.05	0.125	9.73	56.43	20.13
July 9	26.10	1.86	0.114	9.64	56.50	20.13
19	+ 27.48	— 1.75	— 0.107	— 9.51	23 26 56.62	— 20.14
29	28.85	1.74	0.106	9.35	56.77	20.16
Aug. 8	30.23	1.86	0.114	9.15	56.96	20.18
18	31.60	2.11	0.129	8.96	57.13	20.22
28	32.98	2.49	0.152	8.78	57.30	20.26
Sept. 7	+ 34.35	— 2.98	— 0.182	— 8.64	23 26 57.43	— 20.31
17	35.73	3.54	0.216	8.57	57.49	20.37
27	37.11	4.13	0.252	8.54	57.50	20.43
Oct. 7	38.48	4.69	0.287	8.58	57.45	20.48
17	39.86	5.19	0.317	8.67	57.35	20.54
27	+ 41.23	— 5.60	— 0.342	— 8.81	23 26 57.20	— 20.60
Nov. 6	42.61	5.83	0.356	8.97	57.03	20.65
16	43.98	5.92	0.362	9.14	56.84	20.70
26	45.36	5.85	0.357	9.29	56.68	20.74
Dec. 6	46.74	5.65	0.345	9.40	56.56	20.77
16	+ 48.11	— 5.37	— 0.328	— 9.45	23 26 56.49	— 20.80
26	49.49	5.05	0.309	9.42	56.51	20.81
36	+ 50.86	— 4.73	— 0.289	— 9.36	23 26 56.57	— 20.81

Mean Obliquity 1904.0 23° 27' 6".39 (Newcomb).

Precession for 1904 . . . . . 50.2573 log = 1.70120

Precession in a Solar Day . . . . . 0.1376 log = 9.13862

Precession in a Sidereal Day . . . . . 0.1372 log = 9.13743

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.
Jan. 1	+8.29863	+0.9956	-0.53020	+1.30392	Feb. 16	+9.17742	+0.9558	-1.19793	+1.04564
2	8.40312	0.9951	0.57030	1.30243	17	9.17967	0.9541	1.20278	1.03357
3	8.48330	0.9938	0.60688	1.30080	18	9.18110	0.9529	1.20744	1.02101
4	8.54233	0.9919	0.64049	1.29903	19	9.18230	0.9522	1.21191	1.00795
5	8.58388	0.9898	0.67157	1.29711	h (10.0) 20	9.18387	0.9521	1.21621	0.99435
h (7.0) 6	+8.61204	+0.9879	-0.70043	+1.29504	21	+9.18659	+0.9525	-1.22632	+0.98018
7	8.63175	0.9866	0.72737	1.29282	22	9.19120	0.9533	1.22427	0.96541
8	8.64787	0.9862	0.75261	1.29046	23	9.19802	0.9541	1.22804	0.94998
9	8.66492	0.9865	0.77633	1.28794	24	9.20674	0.9545	1.23164	0.93385
10	8.68592	0.9873	0.79869	1.28527	25	9.21659	0.9543	1.23508	0.91697
11	+8.71206	+0.9882	-0.81983	+1.28245	26	+9.22645	+0.9531	-1.23836	+0.89928
12	8.74194	0.9890	0.83985	1.27947	27	9.23520	0.9512	1.24148	0.88072
13	8.77320	0.9893	0.85886	1.27633	28	9.24194	0.9487	1.24445	0.86119
14	8.80366	0.9890	0.87694	1.27303	29	9.24635	0.9463	1.24726	0.84061
15	8.83149	0.9882	0.89416	1.26956	Mar. 1	9.24873	0.9442	1.24992	0.81888
16	+8.85564	+0.9868	-0.91059	+1.26593	2	+9.24971	+0.9430	-1.25243	+0.79588
17	8.87593	0.9851	0.92629	1.26213	3	9.25037	0.9427	1.25479	0.77146
18	8.89243	0.9832	0.94130	1.25817	4	9.25176	0.9433	1.25700	0.74546
19	8.90558	0.9813	0.95568	1.25402	5	9.25460	0.9444	1.25907	0.71768
20	8.91582	0.9796	0.96946	1.24970	h (11.0) 6	9.25909	0.9457	1.26100	0.68786
h (8.0) 21	+8.92376	+0.9781	-0.98268	+1.24520	7	+9.26496	+0.9466	-1.26279	+0.65573
22	8.93049	0.9771	0.99538	1.24051	8	9.27166	0.9470	1.26444	0.62089
23	8.93697	0.9766	1.00757	1.23563	9	9.27832	0.9468	1.26595	0.58289
24	8.94453	0.9766	1.01930	1.23057	10	9.28445	0.9460	1.26732	0.54112
25	8.95463	0.9771	1.03058	1.22530	11	9.28966	0.9447	1.26856	0.49478
26	+8.96802	+0.9778	-1.04144	+1.21984	12	+9.29361	+0.9432	-1.26966	+0.44277
27	8.98471	0.9783	1.05190	1.21416	13	9.29645	0.9417	1.27062	0.38355
28	9.00381	0.9783	1.06198	1.20828	14	9.29824	0.9402	1.27145	0.31486
29	9.02358	0.9776	1.07169	1.20218	15	9.29916	0.9391	1.27215	0.23310
30	9.04214	0.9760	1.08105	1.19586	16	9.29938	0.9384	1.27272	0.13220
31	+9.05793	+0.9737	-1.09008	+1.18930	17	+9.29933	+0.9382	-1.27315	+0.00042
Feb. 1	9.06989	0.9710	1.09879	1.18251	18	9.29944	0.9387	1.27346	9.81028
2	9.07813	0.9684	1.10719	1.17548	19	9.30031	0.9397	1.27363	+9.46415
3	9.08332	0.9664	1.11530	1.16819	20	9.30250	0.9412	1.27367	-8.80341
h (9.0) 4	9.08693	0.9652	1.12312	1.16064	h (12.0) 21	9.30636	0.9429	1.27358	9.62132
5	+9.09050	+0.9648	-1.13067	+1.15283	22	+9.31180	+0.9443	-1.27337	-9.88779
6	9.09538	0.9651	1.13795	1.14473	23	9.31846	0.9451	1.27302	0.05155
7	9.10240	0.9658	1.14498	1.13634	24	9.32554	0.9450	1.27254	0.17002
8	9.11156	0.9664	1.15176	1.12765	25	9.33216	0.9441	1.27193	0.26285
9	9.12231	0.9667	1.15830	1.11865	26	9.33750	0.9426	1.27119	0.33913
10	+9.13351	+0.9663	-1.16461	+1.10933	27	+9.34112	+0.9409	-1.27032	-0.40384
11	9.14433	0.9653	1.17069	1.09966	28	9.34303	0.9395	1.26932	0.46000
12	9.15409	0.9638	1.17656	1.08964	29	9.34376	0.9388	1.26819	0.50958
13	9.16239	0.9620	1.18221	1.07924	30	9.34406	0.9391	1.26693	0.55393
14	9.16897	0.9599	1.18765	1.06846	31	9.34477	0.9402	1.26553	0.59403
15	+9.17389	+0.9578	-1.19289	+1.05726	Apr. 1	+9.34655	+0.9421	-1.26401	-0.63060
16	+9.17742	+0.9558	-1.19793	+1.04564	2	+9.34984	+0.9442	-1.26234	-0.66419



# BESSELIAN STAR-NUMBERS, 1904.

525

(CONSTANTS OF PARIS CONFERENCE.)

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.
Apr. 1	+9.34655	+0.9421	-1.26401	-0.63060	May 17	+9.50664	+0.9799	-1.01182	-1.23384
2	9.34984	0.9442	1.26234	0.66419	18	9.51280	0.9802	1.00045	1.23853
3	9.35438	0.9462	1.26055	0.69523	19	9.51844	0.9798	0.98866	1.24304
4	9.35987	0.9476	1.25862	0.72407	20	9.52311	0.9789	0.97641	1.24738
5	9.36560	0.9485	1.25656	0.75098	21	9.52658	0.9778	0.96369	1.25155
h (13.0) 6	+9.37105	+0.9487	-1.25435	-0.77619	h (16.0) 22	+9.52898	+0.9771	-0.95046	-1.25557
7	9.37577	0.9484	1.25201	0.79988	23	9.53071	0.9771	0.93671	1.25942
8	9.37963	0.9477	1.24953	0.82221	24	9.53236	0.9780	0.92238	1.26311
9	9.38254	0.9470	1.24690	0.84332	25	9.53444	0.9796	0.90744	1.26667
10	9.38460	0.9464	1.24414	0.86331	26	9.53743	0.9817	0.89185	1.27005
11	+9.38593	+0.9460	-1.24123	-0.88230	27	+9.54139	+0.9838	-0.87555	-1.27329
12	9.38670	0.9459	1.23817	0.90036	28	9.54618	0.9857	0.85851	1.27639
13	9.38721	0.9464	1.23497	0.91757	29	9.55151	0.9870	0.84064	1.27934
14	9.38782	0.9474	1.23161	0.93399	30	9.55691	0.9876	0.82189	1.28216
15	9.38892	0.9490	1.22811	0.94968	31	9.56202	0.9877	0.80217	1.28483
16	+9.39094	+0.9511	-1.22445	-0.96469	June 1	+9.56656	+0.9872	-0.78139	-1.28736
17	9.39428	0.9534	1.22063	0.97908	2	9.57043	0.9866	0.75944	1.28976
18	9.39902	0.9556	1.21666	0.99287	3	9.57366	0.9858	0.73620	1.29203
19	9.40488	0.9573	1.21252	1.00610	4	9.57633	0.9851	0.71153	1.29416
20	9.41130	0.9582	1.20822	1.01882	5	9.57849	0.9847	0.68524	1.29616
h (14.0) 21	+9.41759	+0.9583	-1.20375	-1.03104	h (17.0) 6	+9.58035	+0.9846	-0.65714	-1.29803
22	9.42307	0.9576	1.19911	1.04280	7	9.58213	0.9849	0.62696	1.29978
23	9.42719	0.9566	1.19429	1.05412	8	9.58409	0.9857	0.59441	1.30139
24	9.42993	0.9556	1.18930	1.06502	9	9.58645	0.9870	0.55909	1.30288
25	9.43146	0.9553	1.18413	1.07553	10	9.58947	0.9886	0.52052	1.30424
26	+9.43246	+0.9557	-1.17877	-1.08566	11	+9.59334	+0.9902	-0.47806	-1.30548
27	9.43364	0.9571	1.17322	1.09543	12	9.59802	0.9916	0.43087	1.30659
28	9.43559	0.9592	1.16748	1.10486	13	9.60335	0.9925	0.37779	1.30758
29	9.43875	0.9617	1.16153	1.11396	14	9.60885	0.9925	0.31719	1.30845
30	9.44311	0.9641	1.15538	1.12275	15	9.61407	0.9918	0.24660	1.30919
May 1	+9.44840	+0.9662	-1.14902	-1.13124	16	+9.61862	+0.9904	-0.16215	-1.30981
2	9.45413	0.9676	1.14244	1.13944	17	9.62220	0.9888	0.05708	1.31032
3	9.45974	0.9683	1.13564	1.14736	18	9.62484	0.9873	0.91807	1.31069
4	9.46492	0.9685	1.12860	1.15502	19	9.62672	0.9864	9.71224	1.31095
5	9.46937	0.9684	1.12133	1.16242	20	9.62834	0.9863	-9.30725	1.31109
h (15.0) 6	+9.47299	+0.9680	-1.11381	-1.16957	h (18.0) 21	+9.63010	+0.9870	+9.04034	-1.31111
7	9.47589	0.9676	1.10603	1.17648	22	9.63243	0.9882	9.62559	1.31101
8	9.47812	0.9674	1.09799	1.18316	23	9.63553	0.9897	9.86607	1.31079
9	9.47992	0.9675	1.08967	1.18961	24	9.63937	0.9911	0.01984	1.31044
10	9.48141	0.9679	1.08107	1.19584	25	9.64374	0.9919	0.13306	1.30998
11	+9.48290	+0.9689	-1.07218	-1.20186	26	+9.64829	+0.9920	+0.22269	-1.30939
12	9.48467	0.9704	1.06297	1.20768	27	9.65266	0.9916	0.29683	1.30869
13	9.48714	0.9724	1.05344	1.21329	28	9.65664	0.9905	0.36004	1.30786
14	9.49056	0.9746	1.04358	1.21871	29	9.66011	0.9892	0.41510	1.30691
15	9.49504	0.9768	1.03337	1.22394	30	9.66299	0.9877	0.46385	1.30584
16	+9.50055	+0.9787	-1.02279	-1.22898	July 1	+9.66534	+0.9863	+0.50757	-1.30465
17	+9.50664	+0.9799	-1.01182	-1.23384	2	+9.66728	+0.9850	+0.54718	-1.30333

$$E = -0''.01 = 0''.001$$

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hour.)	Log A.	Log F.	Log C.	Log D.
July 1	+9.66534	+0.9863	+0.50757	-1.30465	Aug. 16	+9.76533	+0.9522	+1.18079	-1.08192
2	9.66728	0.9850	0.54718	1.30333	17	9.76704	0.9530	1.18603	1.07176
3	9.66890	0.9841	0.58337	1.30188	18	9.76921	0.9536	1.19108	1.06122
4	9.67033	0.9836	0.61666	1.30032	19	9.77172	0.9536	1.19596	1.05030
5	9.67182	0.9835	0.64748	1.29862	20	9.77426	0.9528	1.20066	1.03897
h (19.0) 6	+9.67355	+0.9839	+0.67614	-1.29680	h (22.0) 21	+9.77661	+0.9514	+1.20519	-1.02720
7	9.67574	0.9847	0.70292	1.29485	22	9.77861	0.9496	1.20955	1.01497
8	9.67856	0.9856	0.72803	1.29277	23	9.78017	0.9474	1.21375	1.00226
9	9.68207	0.9864	0.75166	1.29055	24	9.78130	0.9452	1.21779	0.98903
10	9.68617	0.9868	0.77395	1.28821	25	9.78207	0.9432	1.22168	0.97525
11	+9.69058	+0.9865	+0.79505	-1.28573	26	+9.78254	+0.9416	+1.22540	-0.96089
12	9.69492	0.9853	0.81505	1.28311	27	9.78280	0.9403	1.22898	0.94590
13	9.69880	0.9834	0.83406	1.28036	28	9.78301	0.9396	1.23241	0.93024
14	9.70195	0.9811	0.85216	1.27747	29	9.78325	0.9394	1.23568	0.91386
15	9.70426	0.9787	0.86942	1.27444	30	9.78373	0.9397	1.23882	0.89669
16	+9.70588	+0.9769	+0.88590	-1.27127	31	+9.78461	+0.9404	+1.24180	-0.87869
17	9.70706	0.9758	0.90167	1.26795	Sept. 1	9.78598	0.9413	1.24465	0.85976
18	9.70823	0.9755	0.91677	1.26448	2	9.78787	0.9420	1.24736	0.83983
19	9.70969	0.9760	0.93124	1.26086	3	9.79019	0.9421	1.24993	0.81880
20	9.71178	0.9769	0.94513	1.25710	4	9.79266	0.9414	1.25236	0.79655
h (20.0) 21	+9.71446	+0.9777	+0.95848	-1.25317	h (23.0) 5	+9.79506	+0.9399	+1.25465	-0.77296
22	9.71765	0.9781	0.97131	1.24909	6	9.79707	0.9377	1.25681	0.74786
23	9.72110	0.9779	0.98366	1.24484	7	9.79853	0.9352	1.25883	0.72107
24	9.72449	0.9771	0.99555	1.24044	8	9.79936	0.9329	1.26073	0.69238
25	9.72762	0.9756	1.00701	1.23587	9	9.79973	0.9313	1.26249	0.66150
26	+9.73031	+0.9737	+1.01806	-1.23112	10	+9.79987	+0.9306	+1.26412	-0.62810
27	9.73251	0.9716	1.02872	1.22620	11	9.80010	0.9310	1.26562	0.59177
28	9.73424	0.9696	1.03900	1.22110	12	9.80070	0.9321	1.26699	0.55196
29	9.73556	0.9677	1.04894	1.21581	13	9.80180	0.9335	1.26823	0.50797
30	9.73658	0.9661	1.05853	1.21034	14	9.80340	0.9348	1.26934	0.45884
31	+9.73740	+0.9649	+1.06781	-1.20467	15	+9.80535	+0.9356	+1.27033	-0.40328
Aug. 1	9.73817	0.9642	1.07677	1.19880	16	9.80743	0.9358	1.27119	0.33937
2	9.73908	0.9640	1.08544	1.19273	17	9.80940	0.9352	1.27192	0.26422
3	9.74031	0.9642	1.09382	1.18645	18	9.81109	0.9340	1.27252	0.17307
4	9.74202	0.9648	1.10193	1.17994	19	9.81241	0.9325	1.27300	0.05735
h (21.0) 5	+9.74432	+0.9653	+1.10977	-1.17322	h (0.0) 20	+9.81331	+0.9309	+1.27335	-0.89886
6	9.74717	0.9655	1.11735	1.16626	21	9.81387	0.9295	1.27357	0.64628
7	9.75039	0.9651	1.12469	1.15906	22	9.81411	0.9284	1.27367	-0.96950
8	9.75370	0.9638	1.13179	1.15161	23	9.81420	0.9277	1.27364	+0.40938
9	9.75676	0.9617	1.13866	1.14391	24	9.81421	0.9275	1.27348	9.78295
10	+9.75926	+0.9591	+1.14530	-1.13594	25	+9.81422	+0.9279	+1.27320	+0.98078
11	9.76108	0.9563	1.15173	1.12769	26	9.81443	0.9289	1.27279	0.11616
12	9.76222	0.9539	1.15796	1.11916	27	9.81495	0.9303	1.27225	0.21917
13	9.76291	0.9522	1.16395	1.11033	28	9.81592	0.9320	1.27158	0.30232
14	9.76345	0.9514	1.16976	1.10119	29	9.81738	0.9336	1.27078	0.37201
15	+9.76417	+0.9515	+1.17537	-1.09172	30	+9.81926	+0.9348	+1.26985	+0.43197
16	+9.76533	+0.9522	+1.18079	-1.08192	Oct. 1	+9.82142	+0.9352	+1.26879	+0.48457

# BESSELIAN STAR-NUMBERS, 1904.

527

(CONSTANTS OF PARIS CONFERENCE.)

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.
Oct. 1	+9.82142	+0.9352	+1.26879	+0.48457	Nov. 16	+9.88170	+0.9590	+1.03819	+1.22152
2	9.82358	0.9348	1.26760	0.53139	17	9.88243	0.9594	1.02729	1.22688
3	9.82549	0.9336	1.26628	0.57357	18	9.88314	0.9602	1.01596	1.23205
4	9.82694	0.9320	1.26482	0.61191	h 19	9.88396	0.9616	1.00419	1.23702
5	9.82785	0.9304	1.26323	0.64705	(4.0) 20	9.88500	0.9633	0.99195	1.24181
h (1.0) 6	+9.82829	+0.9294	+1.26150	+0.67945	21	+9.88634	+0.9654	+0.97921	+1.24642
7	9.82843	0.9292	1.25963	0.70950	22	9.88810	0.9675	0.96594	1.25084
8	9.82862	0.9300	1.25762	0.73750	23	9.89024	0.9694	0.95210	1.25509
9	9.82910	0.9318	1.25548	0.76370	24	9.89273	0.9708	0.93767	1.25916
10	9.83006	0.9340	1.25319	0.78830	25	9.89535	0.9714	0.92259	1.26306
11	+9.83154	+0.9363	+1.25076	+0.81147	26	+9.89790	+0.9712	+0.90683	+1.26680
12	9.83344	0.9382	1.24818	0.83335	27	9.90016	0.9704	0.89032	1.27036
13	9.83556	0.9394	1.24545	0.85407	28	9.90199	0.9691	0.87301	1.27377
14	9.83766	0.9398	1.24258	0.87373	29	9.90332	0.9680	0.85483	1.27702
15	9.83954	0.9397	1.23955	0.89242	30	9.90430	0.9675	0.83571	1.28011
16	+9.84110	+0.9390	+1.23637	+0.91023	Dec. 1	+9.90512	+0.9678	+0.81556	+1.28304
17	9.84224	0.9383	1.23303	0.92721	2	9.90604	0.9690	0.79427	1.28582
18	9.84306	0.9376	1.22954	0.94344	3	9.90728	0.9708	0.77174	1.28845
19	9.84360	0.9372	1.22588	0.95897	4	9.90806	0.9729	0.74782	1.29093
20	9.84394	0.9371	1.22206	0.97384	h 5	9.91109	0.9749	0.72235	1.29326
h (2.0) 21	+9.84419	+0.9376	+1.21807	+0.98810	(5.0) 6	+9.91356	+0.9764	+0.69515	+1.29544
22	9.84445	0.9386	1.21390	1.00179	7	9.91616	0.9771	0.66596	1.29747
23	9.84488	0.9401	1.20956	1.01493	8	9.91871	0.9771	0.63453	1.29936
24	9.84557	0.9420	1.20505	1.02757	9	9.92103	0.9765	0.60048	1.30111
25	9.84665	0.9443	1.20035	1.03974	10	9.92301	0.9755	0.56338	1.30271
26	+9.84817	+0.9466	+1.19646	+1.05145	11	+9.92465	+0.9744	+0.52265	+1.30417
27	9.85014	0.9485	1.19038	1.06272	12	9.92600	0.9734	0.47754	1.30549
28	9.85241	0.9498	1.18511	1.07360	13	9.92711	0.9727	0.42705	1.30667
29	9.85476	0.9503	1.17963	1.08408	14	9.92808	0.9723	0.36973	1.30771
30	9.85696	0.9500	1.17394	1.09419	15	9.92900	0.9724	0.30351	1.30861
31	+9.85880	+0.9491	+1.16805	+1.10395	16	+9.92998	+0.9729	+0.22518	+1.30937
Nov. 1	9.86015	0.9480	1.16193	1.11337	17	9.93110	0.9738	0.12936	1.31000
2	9.86103	0.9473	1.15559	1.12247	18	9.93246	0.9750	0.00603	1.31048
3	9.86157	0.9473	1.14901	1.13125	19	9.93415	0.9764	9.83292	1.31083
h 4	9.86207	0.9483	1.14219	1.13974	20	9.93622	0.9776	9.54041	1.31104
(3.0) 5	+9.86279	+0.9502	+1.13513	+1.14794	(6.0) 21	+9.93858	+0.9784	+8.12508	+1.31112
6	9.86391	0.9526	1.12781	1.15585	22	9.94113	0.9785	-9.50573	1.31105
7	9.86554	0.9552	1.12022	1.16350	23	9.94368	0.9778	9.81567	1.31085
8	9.86763	0.9576	1.11236	1.17089	24	9.94601	0.9764	9.99461	1.31052
9	9.87002	0.9593	1.10422	1.17802	25	9.94797	0.9744	0.12088	1.31004
10	+9.87248	+0.9603	+1.09578	+1.18492	26	+9.94949	+0.9724	-0.21849	+1.30943
11	9.87481	0.9606	1.08703	1.19157	27	9.95059	0.9708	0.29803	1.30867
12	9.87684	0.9604	1.07796	1.19800	28	9.95146	0.9700	0.36513	1.30778
13	9.87852	0.9599	1.06856	1.20420	29	9.95230	0.9700	0.42312	1.30675
14	9.87985	0.9593	1.05880	1.21018	30	9.95335	0.9708	0.47415	1.30558
15	+9.88088	+0.9590	+1.04869	+1.21595	31	+9.95474	+0.9720	-0.51970	+1.30427
16	+9.88170	+0.9590	+1.03819	+1.22152	32	+9.95656	+0.9732	-0.56080	+1.30281

$$E = - 0''.01 = - 0^s.001$$

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	$\tau$	$f$	$f'$	$G$		$H$		Log $g$ .	Log $h$ .	$i$	Log $i$ .		
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.						
	y	s	s	°	h m	°	h m			"			
Jan.	1	+0.0012	+0.066	-0.004	87 41.6	5 50.8	350 26.5	23 21.8	+0.99592	+1.31000	-1.47	-0.1674	
	2	0.0039	0.076	+0.002	87 3.8	5 48.2	349 30.1	23 18.0	0.99564	1.30976	1.61	0.2076	
	3	0.0066	0.086	0.008	86 27.5	5 45.8	348 33.7	23 14.3	0.99462	1.30951	1.75	0.2442	
	4	0.0094	0.096	0.012	85 55.6	5 43.7	347 37.1	23 10.5	0.99297	1.30925	1.90	0.2778	
	h	5	0.0121	0.106	0.012	85 29.9	5 42.0	346 40.5	23 6.7	0.99112	1.30897	2.04	0.3088
	(7.0)	6	+0.0149	+0.116	+0.010	85 10.6	5 40.7	345 43.8	23 2.9	+0.98943	+1.30865	-2.18	-0.3377
	7	0.0176	0.126	0.006	84 56.4	5 39.8	344 47.1	22 59.1	0.98832	1.30832	2.32	0.3646	
	8	0.0203	0.135	+0.001	84 44.6	5 39.0	343 50.2	22 55.3	0.98798	1.30797	2.45	0.3899	
	9	0.0231	0.145	-0.003	84 32.3	5 38.1	342 53.2	22 51.5	0.98843	1.30761	2.59	0.4136	
	10	0.0258	0.155	0.006	84 16.8	5 37.1	341 56.2	22 47.7	0.98945	1.30722	2.73	0.4360	
	11	+0.0286	+0.164	-0.006	83 56.5	5 35.8	340 59.0	22 43.9	+0.99069	+1.30682	-2.87	-0.4571	
	12	0.0313	0.174	0.005	83 31.5	5 34.1	340 1.7	22 40.1	0.99181	1.30640	3.00	0.4771	
	13	0.0340	0.184	-0.002	83 3.1	5 32.2	339 4.4	22 36.3	0.99252	1.30596	3.13	0.4961	
	14	0.0368	0.193	+0.002	82 32.8	5 30.2	338 6.9	22 32.5	0.99272	1.30551	3.27	0.5142	
	15	0.0395	0.202	0.006	82 2.6	5 28.2	337 9.2	22 28.6	0.99235	1.30504	3.40	0.5314	
	16	+0.0422	+0.212	+0.008	81 34.1	5 26.3	336 11.5	22 24.8	+0.99149	+1.30455	-3.53	-0.5479	
	17	0.0450	0.221	0.010	81 8.3	5 24.5	335 13.6	22 20.9	0.99027	1.30405	3.66	0.5636	
	18	0.0477	0.230	0.009	80 45.7	5 23.0	334 15.7	22 17.0	0.98888	1.30355	3.79	0.5786	
	19	0.0505	0.239	0.008	80 26.5	5 21.8	333 17.6	22 13.2	0.98738	1.30301	3.92	0.5929	
	h	20	0.0532	0.248	+0.005	80 10.8	5 20.7	332 19.3	22 9.3	0.98598	1.30248	4.04	0.6067
	(8.0)	21	+0.0559	+0.257	0.000	79 58.1	5 19.9	331 21.0	22 5.4	+0.98479	+1.30192	-4.17	-0.6199
	22	0.0587	0.266	-0.004	79 47.5	5 19.2	330 22.4	22 1.5	0.98400	1.30136	4.29	0.6326	
	23	0.0614	0.275	0.009	79 37.8	5 18.5	329 23.8	21 57.6	0.98372	1.30077	4.41	0.6448	
	24	0.0641	0.284	0.013	79 27.2	5 17.8	328 25.0	21 53.7	0.98401	1.30019	4.53	0.6566	
	25	0.0669	0.292	0.016	79 13.3	5 16.9	327 26.1	21 49.7	0.98483	1.29958	4.65	0.6678	
	26	+0.0696	+0.300	-0.015	78 54.6	5 15.6	326 27.0	21 45.8	+0.98597	+1.29898	-4.77	-0.6787	
	27	0.0724	0.309	0.012	78 30.0	5 14.0	325 27.8	21 41.9	0.98712	1.29836	4.89	0.6892	
	28	0.0751	0.317	0.007	77 59.9	5 12.0	324 28.4	21 37.9	0.98794	1.29773	5.00	0.6993	
	29	0.0778	0.325	-0.001	77 26.2	5 9.7	323 28.9	21 33.9	0.98811	1.29710	5.12	0.7090	
	30	0.0806	0.333	+0.005	76 51.6	5 7.4	322 29.2	21 29.9	0.98751	1.29647	5.23	0.7183	
	Feb.	31	+0.0833	+0.341	+0.010	76 19.3	5 5.3	321 29.3	21 25.9	+0.98616	+1.29583	-5.34	-0.7274
		1	0.0860	0.349	0.011	75 52.2	5 3.5	320 29.3	21 21.9	0.98433	1.29518	5.45	0.7361
2		0.0888	0.357	0.010	75 31.7	5 2.1	319 29.2	21 17.9	0.98242	1.29452	5.55	0.7445	
3		0.0915	0.365	0.007	75 17.8	5 1.2	318 28.8	21 13.9	0.98082	1.29387	5.66	0.7526	
h		4	0.0943	0.373	+0.003	75 8.3	5 0.6	317 28.3	21 9.9	0.97993	1.29320	5.76	0.7604
(9.0)		5	+0.0970	+0.380	-0.002	75 0.6	5 0.0	316 27.7	21 5.8	+0.97983	+1.29255	-5.86	-0.7679
6		0.0997	0.388	0.005	74 51.6	4 59.4	315 26.8	21 1.8	0.98048	1.29189	5.96	0.7752	
7		0.1025	0.395	0.006	74 38.9	4 58.6	314 25.8	20 57.7	0.98160	1.29122	6.06	0.7822	
8		0.1052	0.402	0.005	74 21.5	4 57.4	313 24.7	20 53.6	0.98284	1.29056	6.15	0.7890	
9		0.1080	0.409	-0.002	73 59.7	4 56.0	312 23.3	20 49.5	0.98386	1.28990	6.25	0.7956	
10		+0.1107	+0.416	+0.002	73 35.1	4 54.3	311 21.8	20 45.5	+0.98440	+1.28924	-6.34	-0.8019	
11		0.1134	0.423	0.006	73 9.5	4 52.6	310 20.1	20 41.3	0.98439	1.28858	6.43	0.8080	
12		0.1162	0.430	0.008	72 44.5	4 51.0	309 18.3	20 37.2	0.98385	1.28794	6.51	0.8138	
13		0.1189	0.437	0.010	72 21.5	4 49.4	308 16.2	20 33.1	0.98288	1.28728	6.60	0.8195	
14		0.1216	0.443	0.010	72 1.5	4 48.1	307 14.1	20 28.9	0.98161	1.28665	6.68	0.8249	
15		+0.1244	+0.450	+0.009	71 45.1	4 47.0	306 11.7	20 24.8	+0.98018	+1.28601	-6.76	-0.8302	
16	+0.1271	+0.456	+0.006	71 32.1	4 46.1	305 9.3	20 20.6	+0.97877	+1.28539	-6.84	-0.8352		

# INDEPENDENT STAR-NUMBERS, 1904.

529

(CONSTANTS OF PARIS CONFERENCE.)

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	$\tau$	$f$	$f'$	$G$		$H$		Log $g$ .	Log $h$ .	$i$	Log $i$ .		
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.						
	$y$	$s$	$s$	$^{\circ}$	$h$ $m$	$^{\circ}$	$h$ $m$			$''$			
Feb.	15	0.1244	+ 0.450	+ 0.009	71 45.1	4 47.0	306 11.7	20 24.8	+0.98018	+1.28601	-6.76	-0.8302	
	16	0.1271	0.456	0.006	71 32.1	4 46.1	305 9.3	20 20.6	0.97877	1.28539	6.84	0.8352	
	17	0.1299	0.462	+ 0.002	71 22.7	4 45.5	304 6.6	20 16.4	0.97747	1.28477	6.92	0.8400	
	18	0.1326	0.468	- 0.002	71 16.3	4 45.1	303 3.8	20 12.3	0.97650	1.28416	6.99	0.8447	
	h	19	0.1353	0.475	0.007	71 11.6	4 44.8	302 0.9	20 8.1	0.97600	1.28356	7.07	0.8492
	(10.0)	20	0.1381	+ 0.481	- 0.012	71 7.6	4 44.5	300 57.8	20 3.9	+0.97608	+1.28298	-7.14	-0.8535
	21	0.1408	0.487	0.015	71 2.2	4 44.1	299 54.6	19 59.6	0.97677	1.28240	7.21	0.8576	
	22	0.1435	0.493	0.016	70 52.8	4 43.5	298 51.2	19 55.4	0.97799	1.28184	7.27	0.8615	
	23	0.1463	0.498	0.014	70 38.0	4 42.5	297 47.8	19 51.2	0.97943	1.28129	7.33	0.8653	
	24	0.1490	0.504	0.010	70 17.3	4 41.2	296 44.2	19 46.9	0.98077	1.28076	7.39	0.8689	
	25	0.1518	+ 0.510	- 0.004	69 51.5	4 39.4	295 40.5	19 42.7	+0.98167	+1.28023	-7.45	-0.8723	
	26	0.1545	0.516	+ 0.002	69 23.2	4 37.5	294 36.6	19 38.4	0.98186	1.27972	7.51	0.8756	
	27	0.1572	0.521	0.007	68 55.0	4 35.7	293 32.7	19 34.2	0.98127	1.27924	7.56	0.8787	
	28	0.1600	0.526	0.010	68 30.7	4 34.0	292 28.6	19 29.9	0.98001	1.27876	7.62	0.8817	
	29	0.1627	0.532	0.010	68 11.7	4 32.8	291 24.5	19 25.6	0.97850	1.27831	7.67	0.8845	
	Mar.	1	0.1654	+ 0.537	+ 0.007	67 59.6	4 32.0	290 20.2	19 21.3	+0.97706	+1.27787	-7.71	-0.8872
		2	0.1682	0.543	+ 0.003	67 53.6	4 31.6	289 15.9	19 17.1	0.97616	1.27746	7.76	0.8897
		3	0.1709	0.548	- 0.001	67 51.0	4 31.4	288 11.5	19 12.8	0.97603	1.27706	7.80	0.8921
		4	0.1737	0.553	0.004	67 48.2	4 31.2	287 6.9	19 8.5	0.97676	1.27668	7.84	0.8943
		5	0.1764	0.558	0.006	67 44.0	4 30.9	286 2.3	19 4.2	0.97810	1.27631	7.88	0.8963
h		6	0.1791	+ 0.563	- 0.005	67 34.9	4 30.3	284 57.6	18 59.8	+0.97979	+1.27597	-7.91	-0.8983
(11.0)		7	0.1819	0.568	- 0.003	67 21.1	4 29.4	283 52.9	18 55.5	0.98147	1.27567	7.95	0.9001
8		0.1846	0.573	+ 0.001	67 3.3	4 28.2	282 48.1	18 51.2	0.98281	1.27537	7.98	0.9017	
9		0.1874	0.578	0.005	66 43.6	4 26.9	281 43.2	18 46.9	0.98365	1.27510	8.00	0.9032	
10		0.1901	0.583	0.008	66 23.6	4 25.6	280 38.3	18 42.6	0.98391	1.27485	8.03	0.9046	
	11	0.1928	+ 0.588	+ 0.010	66 4.7	4 24.3	279 33.4	18 38.2	+0.98371	+1.27463	-8.05	-0.9058	
	12	0.1956	0.593	0.011	65 48.6	4 23.2	278 28.4	18 33.9	0.98312	1.27443	8.07	0.9069	
	13	0.1983	0.598	0.010	65 35.6	4 22.4	277 23.4	18 29.6	0.98232	1.27424	8.09	0.9079	
	14	0.2010	0.603	0.008	65 26.1	4 21.7	276 18.4	18 25.2	0.98146	1.27408	8.10	0.9087	
	15	0.2038	0.607	+ 0.004	65 19.8	4 21.3	275 13.3	18 20.9	0.98067	1.27395	8.12	0.9094	
	16	0.2065	+ 0.612	0.000	65 17.0	4 21.1	274 8.3	18 16.6	+0.98011	+1.27385	-8.13	-0.9100	
	17	0.2093	0.617	- 0.005	65 16.7	4 21.1	273 3.3	18 12.2	0.97997	1.27377	8.14	0.9104	
	18	0.2120	0.622	0.010	65 17.7	4 21.2	271 58.3	18 7.9	0.98037	1.27372	8.14	0.9107	
	19	0.2147	0.626	0.013	65 18.3	4 21.2	270 53.3	18 3.6	0.98138	1.27368	8.15	0.9109	
	20	0.2175	0.631	0.015	65 16.2	4 21.1	269 48.4	17 59.2	0.98301	1.27367	8.15	0.9109	
h	21	0.2202	+ 0.636	- 0.014	65 9.5	4 20.6	268 43.5	17 54.9	+0.98504	+1.27369	-8.15	-0.9108	
	(12.0)	22	0.2229	0.640	0.011	64 57.3	4 19.8	267 38.6	17 50.6	0.98715	1.27374	8.14	0.9106
	23	0.2257	0.645	- 0.006	64 39.4	4 18.6	266 33.8	17 46.3	0.98902	1.27380	8.13	0.9103	
	24	0.2284	0.650	0.000	64 17.5	4 17.2	265 29.1	17 41.9	0.99031	1.27389	8.12	0.9098	
	25	0.2312	0.655	+ 0.005	63 54.2	4 15.6	264 24.4	17 37.6	0.99085	1.27401	8.11	0.9092	
	26	0.2339	+ 0.660	+ 0.008	63 32.7	4 14.2	263 19.8	17 33.3	+0.99063	+1.27414	-8.10	-0.9085	
	27	0.2366	0.664	0.009	63 15.7	4 13.0	262 15.3	17 29.0	0.99005	1.27430	8.08	0.9076	
	28	0.2394	0.669	0.007	63 5.1	4 12.3	261 10.9	17 24.7	0.98929	1.27448	8.07	0.9066	
	29	0.2421	0.674	+ 0.004	63 0.5	4 12.0	260 6.6	17 20.4	0.98889	1.27469	8.05	0.9055	
	30	0.2448	0.679	0.000	63 0.4	4 12.0	259 2.4	17 16.2	0.98916	1.27492	8.02	0.9042	
Apr.	31	0.2476	+ 0.684	- 0.005	63 1.9	4 12.1	257 58.4	17 11.9	+0.99024	+1.27517	-8.00	-0.9028	
	1	0.2503	+ 0.689	- 0.007	63 2.2	4 12.1	256 54.4	17 7.6	+0.99209	+1.27545	-7.97	-0.9013	

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Std. Hour.)		$\tau$	$f$	$f'$	$G$		$H$		Log $g$ .	Log $h$ .	$i$	Log $i$ .	
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.					
		y	s	s	° ' "	h m	° ' "	h m					
Apr.	1	0.2503	+ 0.689	- 0.007	63 2.2	4 12.1	256 54.4	17 7.6	+0.99209	+1.27545	-7.97	-0.9013	
	2	0.2531	0.694	0.007	62 58.4	4 11.9	255 50.5	17 3.3	0.99445	1.27573	7.94	0.8996	
	3	0.2558	0.699	0.004	62 50.1	4 11.4	254 46.8	16 59.1	0.99694	1.27606	7.90	0.8978	
	4	0.2585	0.704	- 0.001	62 37.2	4 10.5	253 43.2	16 54.9	0.99925	1.27639	7.87	0.8959	
	h	5	0.2613	0.709	+ 0.004	62 21.2	4 9.4	252 39.7	16 50.6	1.00110	1.27675	7.83	0.8938
	(13.0)	6	0.2640	+ 0.714	+ 0.007	62 4.1	4 8.3	251 36.4	16 46.4	+1.00245	+1.27712	-7.79	-0.8916
	7	0.2668	0.719	0.010	61 47.6	4 7.2	250 33.2	16 42.2	1.00326	1.27752	7.75	0.8893	
	8	0.2695	0.725	0.011	61 32.8	4 6.2	249 30.2	16 38.0	1.00365	1.27793	7.71	0.8868	
	9	0.2722	0.730	0.011	61 20.8	4 5.4	248 27.2	16 33.8	1.00378	1.27836	7.66	0.8842	
	10	0.2750	0.736	0.009	61 11.8	4 4.8	247 24.5	16 29.6	1.00375	1.27881	7.61	0.8814	
	11	0.2777	+ 0.741	+ 0.006	61 6.0	4 4.4	246 22.0	16 25.5	+1.00376	+1.27927	-7.56	-0.8785	
	12	0.2804	0.747	+ 0.002	61 3.2	4 4.2	245 19.6	16 21.3	1.00390	1.27975	7.51	0.8754	
	13	0.2832	0.752	- 0.003	61 3.0	4 4.2	244 17.2	16 17.1	1.00435	1.28024	7.45	0.8722	
	14	0.2859	0.758	0.008	61 4.3	4 4.3	243 15.3	16 13.0	1.00528	1.28075	7.39	0.8689	
	15	0.2887	0.763	0.011	61 6.0	4 4.4	242 13.4	16 8.9	1.00675	1.28128	7.33	0.8654	
h	16	0.2914	+ 0.769	- 0.014	61 6.2	4 4.4	241 11.8	16 4.7	+1.00883	+1.28180	-7.27	-0.8617	
	17	0.2941	0.775	0.014	61 2.8	4 4.2	240 10.2	16 0.7	1.01137	1.28236	7.21	0.8579	
	18	0.2969	0.781	0.011	60 54.1	4 3.6	239 8.9	15 56.6	1.01415	1.28292	7.14	0.8539	
	19	0.2996	0.787	0.007	60 40.1	4 2.7	238 7.9	15 52.5	1.01684	1.28348	7.08	0.8498	
	h	20	0.3023	0.793	- 0.001	60 21.5	4 1.4	237 6.9	15 48.5	1.01912	1.28407	7.01	0.8455
	(14.0)	21	0.3051	+ 0.799	+ 0.004	60 0.3	4 0.0	236 6.2	15 44.4	+1.02073	+1.28465	-6.94	-0.8410
	22	0.3078	0.805	0.008	59 39.2	3 58.6	235 5.7	15 40.4	1.02164	1.28524	6.86	0.8364	
	23	0.3106	0.812	0.010	59 21.4	3 57.4	234 5.4	15 36.4	1.02192	1.28583	6.79	0.8316	
	24	0.3133	0.818	0.008	59 8.6	3 56.6	233 5.3	15 32.4	1.02194	1.28645	6.71	0.8266	
	25	0.3160	0.825	+ 0.005	59 1.9	3 56.1	232 5.4	15 28.4	1.02205	1.28707	6.63	0.8214	
	26	0.3188	+ 0.831	0.000	59 0.0	3 56.0	231 5.7	15 24.4	+1.02265	+1.28768	-6.55	-0.8160	
	27	0.3215	0.838	- 0.004	59 0.7	3 56.0	230 6.2	15 20.4	1.02398	1.28831	6.46	0.8105	
	28	0.3242	0.844	0.007	59 1.2	3 56.1	229 7.0	15 16.5	1.02605	1.28893	6.38	0.8048	
	29	0.3270	0.851	0.008	58 58.9	3 55.9	228 7.9	15 12.5	1.02872	1.28956	6.29	0.7988	
	30	0.3297	0.858	0.006	58 52.2	3 55.5	227 9.0	15 8.6	1.03167	1.29020	6.20	0.7926	
May	1	0.3325	+ 0.865	- 0.003	58 40.5	3 54.7	226 10.4	15 4.7	+1.03459	+1.29082	-6.11	-0.7863	
	2	0.3352	0.872	+ 0.001	58 25.5	3 53.7	225 11.9	15 0.8	1.03716	1.29145	6.02	0.7797	
	3	0.3379	0.879	0.006	58 8.4	3 52.6	224 13.6	14 56.9	1.03926	1.29209	5.93	0.7729	
	4	0.3407	0.887	0.009	57 50.6	3 51.4	223 15.5	14 53.0	1.04085	1.29273	5.83	0.7659	
	5	0.3434	0.894	0.011	57 34.0	3 50.3	222 17.6	14 49.2	1.04200	1.29336	5.74	0.7586	
	h	6	0.3462	+ 0.901	+ 0.011	57 19.7	3 49.3	221 19.9	+1.04277	+1.29401	-5.64	-0.7511	
	(15.0)	7	0.3489	0.909	0.010	57 7.9	3 48.5	220 22.4	1.04337	1.29461	5.54	0.7433	
	8	0.3516	0.916	0.007	56 59.0	3 47.9	219 25.0	14 37.7	1.04387	1.29523	5.44	0.7353	
	9	0.3544	0.924	+ 0.003	56 52.8	3 47.4	218 27.9	14 33.9	1.04446	1.29585	5.33	0.7269	
	10	0.3571	0.932	- 0.001	56 49.1	3 47.3	217 31.0	14 30.1	1.04523	1.29647	5.23	0.7183	
	11	0.3598	+ 0.940	- 0.006	56 47.2	3 47.1	216 34.2	14 26.3	+1.04636	+1.29708	-5.12	-0.7094	
	12	0.3626	0.948	0.010	56 46.3	3 47.1	215 37.6	14 22.5	1.04795	1.29767	5.01	0.7002	
	13	0.3653	0.956	0.013	56 44.4	3 47.0	214 41.1	14 18.7	1.05007	1.29826	4.91	0.6907	
	14	0.3681	0.964	0.013	56 40.2	3 46.7	213 44.9	14 15.0	1.05266	1.29885	4.80	0.6808	
	15	0.3708	0.972	0.012	56 32.0	3 46.1	212 48.9	14 11.3	1.05557	1.29944	4.68	0.6706	
16	0.3735	+ 0.980	- 0.008	56 18.7	3 45.2	211 53.0	14 7.5	+1.05854	+1.30001	-4.57	-0.6601		
17	0.3763	+ 0.988	- 0.003	56 0.7	3 44.1	210 57.3	14 3.8	+1.06126	+1.30057	-4.46	-0.6491		

## INDEPENDENT STAR-NUMBERS, 1904.

531

(CONSTANTS OF PARIS CONFERENCE.)

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. Sid. Hour.)	$\tau$	$f$	$f'$	$G$		$H$		Log $g$ .	Log $h$ .	$i$	Log $i$ .		
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.						
		s	s	°	h m	°	h m			"			
May	17	0.3763	+ 0.988	- 0.003	56 0.7	3 44.1	210 57.3	14 3.8	+1.06126	+1.30057	- 4.46	- 0.6491	
	18	0.3790	0.997	+ 0.003	55 39.3	3 42.6	210 1.7	14 0.1	1.06343	1.30113	4.34	0.6377	
	19	0.3817	1.005	0.008	55 16.9	3 41.1	209 6.3	13 56.4	1.06496	1.30166	4.23	0.6259	
	20	0.3845	1.014	0.010	54 56.0	3 39.7	208 11.0	13 52.7	1.06585	1.30219	4.11	0.6137	
	b	21	0.3872	1.023	0.010	54 39.2	3 38.6	207 16.0	13 49.1	1.06630	1.30270	3.99	0.6010
	(16.0)	22	0.3900	+ 1.031	+ 0.007	54 27.5	3 37.8	206 21.0	13 45.4	+1.06662	+1.30321	- 3.87	- 0.5877
	23	0.3927	1.040	+ 0.002	54 21.0	3 37.3	205 26.3	13 41.7	1.06722	1.30372	3.75	0.5740	
	24	0.3954	1.049	- 0.003	54 18.1	3 37.2	204 31.7	13 38.1	1.06834	1.30418	3.63	0.5596	
	25	0.3982	1.058	0.006	54 16.4	3 37.1	203 37.1	13 34.5	1.07012	1.30466	3.51	0.5447	
	26	0.4009	1.067	0.008	54 13.0	3 36.9	202 42.9	13 30.9	1.07252	1.30512	3.38	0.5291	
	27	0.4036	+ 1.076	- 0.008	54 6.3	3 36.4	201 48.6	13 27.2	+1.07530	+1.30555	- 3.26	- 0.5128	
June	28	0.4064	1.085	- 0.005	53 55.3	3 35.7	200 54.6	13 23.6	1.07818	1.30598	3.13	0.4958	
	29	0.4091	1.094	0.000	53 40.1	3 34.7	200 0.6	13 20.0	1.08089	1.30638	3.01	0.4779	
	30	0.4119	1.103	+ 0.004	53 22.0	3 33.5	199 6.7	13 16.4	1.08321	1.30679	2.88	0.4592	
	31	0.4146	1.112	0.008	53 2.8	3 32.2	198 13.0	13 12.9	1.08506	1.30716	2.75	0.4394	
	1	0.4173	+ 1.122	+ 0.010	52 43.8	3 30.9	197 19.4	13 9.3	+1.08644	+1.30752	- 2.62	- 0.4187	
	2	0.4201	1.131	0.011	52 26.4	3 29.8	196 25.9	13 5.7	1.08743	1.30787	2.49	0.3967	
	3	0.4228	1.141	0.010	52 11.1	3 28.7	195 32.4	13 2.2	1.08817	1.30820	2.36	0.3735	
	4	0.4255	1.150	0.008	51 58.3	3 27.9	194 39.1	12 58.6	1.08879	1.30851	2.23	0.3488	
	h	5	0.4283	1.159	+ 0.004	51 48.3	3 27.2	193 45.8	12 55.1	1.08931	1.30881	2.10	0.3225
	(17.0)	6	0.4310	+ 1.169	0.000	51 40.7	3 26.7	192 52.6	12 51.5	+1.08995	+1.30909	- 1.97	- 0.2944
	7	0.4338	1.179	- 0.005	51 35.2	3 26.3	191 59.5	12 48.0	1.09083	1.30937	1.84	0.2642	
July	8	0.4365	1.188	0.010	51 30.7	3 26.0	191 6.5	12 44.4	1.09209	1.30960	1.71	0.2317	
	9	0.4392	1.198	0.013	51 26.5	3 25.8	190 13.5	12 40.9	1.09379	1.30983	1.57	0.1964	
	10	0.4420	1.208	0.014	51 21.0	3 25.4	189 20.6	12 37.4	1.09592	1.31004	1.44	0.1578	
	11	0.4447	+ 1.217	- 0.013	51 12.4	3 24.8	188 27.8	12 33.9	+1.09844	+1.31024	- 1.30	- 0.1153	
	12	0.4475	1.227	0.010	50 59.8	3 24.0	187 35.0	12 30.3	1.10115	1.31041	1.17	0.0681	
	13	0.4502	1.237	- 0.005	50 42.4	3 22.8	186 42.3	12 26.8	1.10378	1.31056	1.04	0.0151	
	14	0.4529	1.246	+ 0.001	50 21.3	3 21.4	185 49.6	12 23.3	1.10604	1.31070	0.90	9.9545	
	15	0.4557	1.256	0.007	49 58.1	3 19.9	184 56.9	12 19.8	1.10775	1.31081	0.77	9.8839	
	16	0.4584	+ 1.266	+ 0.010	49 34.9	3 18.3	184 4.3	12 16.3	+1.10885	+1.31090	- 0.63	- 9.7994	
	17	0.4611	1.276	0.011	49 14.5	3 17.0	183 11.7	12 12.8	1.10941	1.31100	0.49	9.6943	
	18	0.4639	1.286	0.009	48 58.4	3 15.9	182 19.1	12 9.3	1.10970	1.31105	0.36	9.5553	
(18.0)	19	0.4666	1.295	+ 0.005	48 47.4	3 15.2	181 26.6	12 5.8	1.10999	1.31109	0.22	9.3495	
	20	0.4694	1.305	0.000	48 40.6	3 14.7	180 34.1	12 2.3	1.11064	1.31111	- 0.09	- 8.9445	
	21	0.4721	+ 1.315	- 0.005	48 36.4	3 14.4	179 41.6	11 58.8	+1.11180	+1.31112	+ 0.05	+ 8.6776	
	22	0.4748	1.325	0.007	48 32.3	3 14.2	178 49.1	11 55.3	1.11353	1.31110	0.18	9.2629	
	23	0.4776	1.335	0.008	48 26.0	3 13.7	177 56.6	11 51.8	1.11573	1.31107	0.32	9.5033	
	24	0.4803	1.345	0.006	48 16.1	3 13.1	177 4.1	11 48.3	1.11818	1.31101	0.45	9.6571	
	25	0.4830	1.354	- 0.002	48 2.1	3 12.1	176 11.6	11 44.8	1.12056	1.31094	0.59	9.7703	
	26	0.4858	+ 1.364	+ 0.002	47 44.8	3 11.0	175 19.1	11 41.3	+1.12270	+1.31084	+ 0.72	+ 9.8600	
	27	0.4885	1.374	0.006	47 25.7	3 9.7	174 26.5	11 37.8	1.12442	1.31073	0.86	9.9341	
	28	0.4913	1.384	0.010	47 6.0	3 8.4	173 34.0	11 34.3	1.12571	1.31060	0.99	9.9973	
	29	0.4940	1.394	0.011	46 47.0	3 7.1	172 41.4	11 30.8	1.12661	1.31045	1.13	0.0524	
30	0.4967	1.403	0.010	46 29.8	3 6.0	171 48.7	11 27.3	1.12718	1.31029	1.26	0.1011		
July.	1	0.4995	+ 1.413	+ 0.008	46 14.8	3 5.0	170 56.1	11 23.7	+1.12756	+1.31011	+ 1.40	+ 0.1448	
	2	0.5022	+ 1.423	+ 0.005	46 2.2	3 4.1	170 3.3	11 20.2	+1.12785	+1.30990	+ 1.53	+ 0.1844	

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	$\tau$	$f'$	$f''$	$G$		$H$		Log $g$ .	Log $h$ .	$i$	Log $i$ .		
		In Time	In Time.	In Arc.	In Time.	In Arc.	In Time.						
	y	s	s	°	h m	°	h m			"			
July (19.0)	1	0.4995	+ 1.413	+ 0.008	46 14.8	3 50	170 56.1	11 23.7	+1.12756	+1.31011	+ 1.40	+ 0.1448	
	2	0.5022	1.423	0.005	46 2.2	3 41	170 3.3	11 20.2	1.12785	1.30990	1.53	0.1844	
	3	0.5050	1.432	+ 0.001	45 52.1	3 35	169 10.5	11 16.7	1.12813	1.30968	1.66	0.2206	
	4	0.5077	1.442	- 0.004	45 44.3	3 30	168 17.7	11 13.2	1.12856	1.30945	1.79	0.2539	
	5	0.5104	1.451	0.009	45 38.2	3 25	167 24.8	11 9.5	1.12924	1.30919	1.93	0.2847	
	6	0.5132	+ 1.461	- 0.012	45 32.9	3 22	166 31.8	11 6.1	+1.13030	+1.30892	+ 2.06	+ 0.3134	
	7	0.5159	1.470	0.014	45 27.3	3 18	165 38.8	11 2.6	1.13176	1.30863	2.19	0.3402	
	8	0.5186	1.480	0.014	45 19.9	3 13	164 45.6	10 59.0	1.13364	1.30832	2.32	0.3653	
	9	0.5214	1.489	0.012	45 9.3	3 06	163 52.4	10 55.5	1.13579	1.30798	2.45	0.3889	
	10	0.5241	1.499	0.007	44 54.5	2 59.6	162 59.1	10 51.9	1.13803	1.30765	2.58	0.4112	
	11	0.5269	+ 1.508	- 0.001	44 35.7	2 58.4	162 5.7	10 48.4	+1.14008	+1.30729	+ 2.71	+ 0.4323	
	12	0.5296	1.517	+ 0.004	44 13.8	2 56.9	161 12.2	10 44.8	1.14172	1.30691	2.83	0.4523	
	13	0.5323	1.526	0.009	43 51.0	2 55.4	160 18.6	10 41.2	1.14281	1.30653	2.96	0.4713	
	14	0.5351	1.535	0.011	43 29.3	2 54.0	159 24.9	10 37.7	1.14335	1.30612	3.09	0.4894	
	15	0.5378	1.544	0.010	43 11.0	2 52.7	158 31.1	10 34.1	1.14347	1.30570	3.21	0.5067	
	16	0.5405	+ 1.553	+ 0.007	42 57.2	2 51.8	157 37.2	10 30.5	+1.14346	+1.30528	+ 3.34	+ 0.5232	
	17	0.5433	1.562	+ 0.002	42 48.2	2 51.2	156 43.2	10 26.9	1.14358	1.30483	3.46	0.5389	
	18	0.5460	1.571	- 0.002	42 42.7	2 50.8	155 49.1	10 23.3	1.14411	1.30436	3.58	0.5540	
	19	0.5488	1.580	0.006	42 38.8	2 50.6	154 54.8	10 19.7	1.14512	1.30389	3.70	0.5685	
	20	0.5515	1.589	0.007	42 34.0	2 50.3	154 0.5	10 16.0	1.14665	1.30341	3.82	0.5824	
h (20.0)	21	0.5542	+ 1.597	- 0.006	42 26.7	2 49.8	153 5.9	10 12.4	+1.14849	+1.30291	+ 3.94	+ 0.5958	
	22	0.5570	1.606	- 0.003	42 15.8	2 49.1	152 11.3	10 8.8	1.15043	1.30240	4.06	0.6086	
	23	0.5597	1.615	+ 0.001	42 1.4	2 48.1	151 16.5	10 5.1	1.15222	1.30188	4.18	0.6209	
	24	0.5624	1.623	0.006	41 44.6	2 47.0	150 21.6	10 1.4	1.15372	1.30135	4.29	0.6328	
	25	0.5652	1.632	0.009	41 26.5	2 45.8	149 26.6	9 57.8	1.15482	1.30080	4.41	0.6443	
	26	0.5679	+ 1.640	+ 0.011	41 8.6	2 44.6	148 31.3	9 54.1	+1.15552	+1.30026	+ 4.52	+ 0.6553	
	27	0.5707	1.648	0.011	40 51.8	2 43.4	147 36.0	9 50.4	1.15587	1.29969	4.63	0.6660	
	28	0.5734	1.656	0.010	40 36.9	2 42.5	146 40.5	9 46.7	1.15598	1.29912	4.75	0.6763	
	29	0.5761	1.664	0.007	40 24.4	2 41.6	145 44.8	9 43.0	1.15595	1.29854	4.86	0.6862	
	30	0.5789	1.672	+ 0.002	40 14.2	2 40.9	144 49.0	9 39.3	1.15588	1.29795	4.96	0.6958	
	31	0.5816	+ 1.680	- 0.002	40 6.3	2 40.4	143 52.9	9 35.5	+1.15585	+1.29737	+ 5.07	+ 0.7051	
	Aug.	1	0.5843	1.688	0.007	40 0.5	2 40.0	142 56.7	9 31.8	1.15601	1.29677	5.18	0.7140
		2	0.5871	1.696	0.011	39 56.2	2 39.7	142 0.4	9 28.0	1.15646	1.29616	5.28	0.7227
		3	0.5898	1.704	0.014	39 52.4	2 39.5	141 3.9	9 24.3	1.15729	1.29555	5.38	0.7311
		4	0.5926	1.711	0.015	39 47.8	2 39.2	140 7.1	9 20.5	1.15852	1.29494	5.49	0.7392
		5	0.5953	+ 1.719	- 0.014	39 41.0	2 38.7	139 10.2	9 16.7	+1.16010	+1.29433	+ 5.59	+ 0.7470
		6	0.5980	1.726	0.010	39 30.7	2 38.1	138 13.2	9 12.9	1.16188	1.29369	5.68	0.7546
		7	0.6008	1.734	- 0.005	39 16.5	2 37.1	137 15.9	9 9.1	1.16362	1.29307	5.78	0.7620
		8	0.6035	1.741	+ 0.001	38 58.8	2 35.9	136 18.4	9 5.2	1.16512	1.29244	5.88	0.7691
		9	0.6063	1.748	0.007	38 38.9	2 34.6	135 20.8	9 1.4	1.16615	1.29181	5.97	0.7759
10		0.6090	+ 1.755	+ 0.010	38 19.2	2 33.3	134 23.0	8 57.5	+1.16667	+1.29119	+ 6.06	+ 0.7826	
11		0.6117	1.762	0.010	38 1.5	2 32.1	133 24.9	8 53.7	1.16674	1.29056	6.15	0.7890	
12		0.6145	1.769	0.008	37 47.8	2 31.2	132 26.6	8 49.8	1.16653	1.28994	6.24	0.7952	
13		0.6172	1.776	+ 0.004	37 38.6	2 30.6	131 28.3	8 45.9	1.16632	1.28930	6.33	0.8012	
14		0.6199	1.783	- 0.001	37 33.6	2 30.2	130 29.7	8 42.0	1.16637	1.28868	6.41	0.8070	
15		0.6227	+ 1.789	- 0.004	37 31.3	2 30.1	129 31.0	8 38.1	+1.16687	+1.28807	+ 6.50	+ 0.8126	
16		0.6254	+ 1.796	- 0.006	37 29.4	2 30.0	128 32.0	8 34.1	+1.16785	+1.28745	+ 6.58	+ 0.8181	



(CONSTANTS OF PARIS CONFERENCE.)

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	$\tau$	$f$		$f'$		$G$		$H$		Log $g$ .	Log $h$ .	$i$	Log $i$ .
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.						
	y	s	s	°	h m	°	h m					"	
Aug. 16	0.6254	+ 1.796	- 0.006	37 29.4	2 30.0	128 32.0	8 34.1	+1.16785	+1.28745	+ 6.58	+ 0.8181		
17	0.6282	1.802	0.006	37 26.1	2 29.7	127 32.9	8 30.2	1.16924	1.28684	6.66	0.8233		
18	0.6309	1.809	- 0.003	37 20.0	2 29.3	126 33.5	8 26.2	1.17082	1.28623	6.73	0.8283		
19	0.6336	1.815	+ 0.001	37 10.3	2 28.7	125 34.0	8 22.3	1.17240	1.28563	6.81	0.8332		
h (22.0)	20	0.6364	1.821	0.005	36 57.8	2 27.9	124 34.3	8 18.3	1.17374	1.28504	6.89	0.8379	
21	0.6391	+ 1.828	+ 0.009	36 43.6	2 26.9	123 34.5	8 14.3	+1.17475	+1.28446	+ 6.96	+ 0.8425		
22	0.6418	1.834	0.011	36 28.9	2 26.0	122 34.4	8 10.3	1.17537	1.28387	7.03	0.8468		
23	0.6446	1.840	0.012	36 14.9	2 25.0	121 34.2	8 6.3	1.17563	1.28331	7.10	0.8510		
24	0.6473	1.846	0.011	36 2.4	2 24.2	120 33.8	8 2.3	1.17561	1.28275	7.16	0.8551		
25	0.6501	1.851	0.008	35 52.0	2 23.5	119 33.1	7 58.2	1.17542	1.28221	7.23	0.8589		
26	0.6528	+ 1.857	+ 0.004	35 43.9	2 22.9	118 32.4	7 54.2	+1.17515	+1.28167	+ 7.29	+ 0.8627		
27	0.6555	1.863	0.000	35 38.2	2 22.5	117 31.4	7 50.1	1.17490	1.28114	7.35	0.8663		
28	0.6583	1.869	- 0.005	35 34.6	2 22.3	116 30.3	7 46.0	1.17478	1.28064	7.41	0.8697		
29	0.6610	1.874	0.010	35 33.0	2 22.2	115 29.0	7 41.9	1.17487	1.28013	7.46	0.8730		
30	0.6637	1.880	0.013	35 32.5	2 22.2	114 27.5	7 37.8	1.17530	1.27965	7.52	0.8761		
31	0.6665	+ 1.886	- 0.015	35 31.9	2 22.1	113 25.9	7 33.7	+1.17613	+1.27918	+ 7.57	+ 0.8791		
Sept. 1	0.6692	1.891	0.014	35 30.1	2 22.0	112 24.1	7 29.6	1.17734	1.27872	7.62	0.8819		
2	0.6720	1.896	0.012	35 25.5	2 21.7	111 22.1	7 25.5	1.17882	1.27829	7.67	0.8846		
3	0.6747	1.901	0.007	35 17.3	2 21.2	110 20.0	7 21.3	1.18041	1.27787	7.71	0.8872		
h (23.0)	4	0.6774	1.907	- 0.001	35 5.5	2 20.4	109 17.7	1.18183	1.27747	7.76	0.8896		
5	0.6802	+ 1.912	+ 0.004	34 50.8	2 19.4	108 15.3	7 13.0	+1.18292	+1.27707	+ 7.80	+ 0.8919		
6	0.6829	1.917	0.008	34 35.3	2 18.4	107 12.7	7 8.8	1.18358	1.27671	7.84	0.8941		
7	0.6857	1.923	0.009	34 20.7	2 17.4	106 10.0	7 4.7	1.18377	1.27635	7.87	0.8961		
8	0.6884	1.928	0.008	34 9.2	2 16.6	105 7.1	7 0.5	1.18361	1.27602	7.91	0.8980		
9	0.6911	1.933	+ 0.004	34 1.9	2 16.1	104 4.2	6 56.3	1.18336	1.27572	7.94	0.8998		
10	0.6939	+ 1.938	0.000	33 59.0	2 15.9	103 1.1	6 52.1	+1.18325	+1.27543	+ 7.97	+ 0.9014		
11	0.6966	1.943	- 0.004	33 59.5	2 16.0	101 57.9	6 47.9	1.18352	1.27516	8.00	0.9029		
12	0.6993	1.948	0.006	34 1.2	2 16.1	100 54.6	6 43.6	1.18427	1.27491	8.02	0.9043		
13	0.7021	1.952	0.006	34 2.5	2 16.2	99 51.2	6 39.4	1.18548	1.27468	8.04	0.9055		
14	0.7048	1.957	- 0.004	34 1.5	2 16.1	98 47.7	6 35.2	1.18699	1.27447	8.06	0.9066		
15	0.7076	+ 1.962	0.000	33 57.3	2 15.8	97 44.1	6 30.9	+1.18859	+1.27430	+ 8.08	+ 0.9076		
16	0.7103	1.967	+ 0.004	33 50.1	2 15.3	96 40.4	6 26.7	1.19006	1.27414	8.10	0.9085		
17	0.7130	1.972	0.008	33 40.7	2 14.7	95 36.7	6 22.4	1.19123	1.27401	8.11	0.9092		
18	0.7158	1.977	0.012	33 30.3	2 14.0	94 32.9	6 18.2	1.19205	1.27389	8.12	0.9098		
19	0.7185	1.982	0.013	33 20.1	2 13.3	93 29.0	6 13.9	1.19252	1.27380	8.13	0.9103		
h (0.0)	20	0.7212	+ 1.986	+ 0.012	33 11.0	2 12.7	92 25.1	+1.19266	+1.27374	+ 8.14	+ 0.9106		
21	0.7240	1.991	0.010	33 3.9	2 12.3	91 21.1	6 5.4	1.19264	1.27369	8.14	0.9108		
22	0.7267	1.996	0.006	32 59.0	2 12.0	90 17.1	6 1.1	1.19248	1.27368	8.15	0.9109		
23	0.7295	2.000	+ 0.002	32 56.1	2 11.7	89 13.0	5 56.9	1.19233	1.27368	8.15	0.9109		
24	0.7322	2.005	- 0.003	32 55.5	2 11.7	88 8.9	5 52.6	1.19229	1.27371	8.14	0.9108		
25	0.7349	+ 2.010	- 0.008	32 56.9	2 11.8	87 4.8	5 48.3	+1.19241	+1.27376	+ 8.14	+ 0.9105		
26	0.7377	2.015	0.011	32 59.7	2 12.0	86 0.7	5 44.0	1.19286	1.27384	8.13	0.9101		
27	0.7404	2.020	0.014	33 3.0	2 12.2	84 56.6	5 39.8	1.19364	1.27394	8.12	0.9095		
28	0.7431	2.024	0.014	33 5.6	2 12.4	83 52.4	5 35.5	1.19483	1.27407	8.11	0.9088		
29	0.7459	2.029	0.012	33 6.1	2 12.4	82 48.3	5 31.2	1.19633	1.27421	8.09	0.9080		
30	0.7486	+ 2.034	- 0.008	33 3.5	2 12.2	81 44.1	5 26.9	+1.19799	+1.27439	+ 8.07	+ 0.9071		
Oct. 1	0.7514	+ 2.039	- 0.003	32 57.3	2 11.8	80 40.0	5 22.7	+1.19964	+1.27458	+ 8.06	+ 0.9061		

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		$\tau$	$f$		$f'$		$G$		$H$		Log $g$ .	Log $h$ .	$i$	Log $i$ .
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.						
Oct.	y	s	s	o	h m	o	h m							
	1	0.7514	+ 2.039	- 0.003	32 57.3	2 11.8	80 40.0	5 22.7	+1.19964	+1.27458	+ 8.06	+ 0.9061		
	2	0.7541	2.044	+ 0.002	32 48.0	2 11.2	79 35.9	5 18.4	1.20105	1.27479	8.03	0.9049		
	3	0.7568	2.049	0.006	32 36.9	2 10.5	78 31.8	5 14.2	1.20206	1.27504	8.01	0.9036		
	4	0.7596	2.054	0.008	32 25.9	2 9.7	77 27.8	5 9.9	1.20262	1.27530	7.98	0.9021		
	h (1.0)	5	0.7623	2.059	0.007	32 16.9	2 9.1	76 23.8	5 5.6	1.20281	1.27559	7.95	0.9005	
	6	0.7651	+ 2.064	+ 0.004	32 11.5	2 8.8	75 19.8	5 1.3	+1.20282	+1.27590	+ 7.92	+ 0.8988		
	7	0.7678	2.069	0.000	32 10.4	2 8.7	74 15.9	4 57.1	1.20287	1.27621	7.89	0.8969		
	8	0.7705	2.074	- 0.004	32 12.8	2 8.9	73 12.0	4 52.8	1.20325	1.27656	7.85	0.8949		
	9	0.7733	2.079	0.007	32 17.4	2 9.2	72 8.2	4 48.5	1.20410	1.27694	7.81	0.8928		
	10	0.7760	2.085	0.008	32 22.0	2 9.5	71 4.5	4 44.3	1.20543	1.27732	7.77	0.8905		
	11	0.7787	+ 2.090	- 0.006	32 24.8	2 9.7	70 0.9	4 40.1	+1.20713	+1.27773	+ 7.73	+ 0.8880		
	12	0.7815	2.095	- 0.002	32 24.7	2 9.6	68 57.4	4 35.8	1.20903	1.27815	7.68	0.8854		
	13	0.7842	2.101	+ 0.003	32 21.4	2 9.4	67 53.9	4 31.6	1.21088	1.27859	7.63	0.8827		
	14	0.7870	2.106	0.007	32 15.5	2 9.0	66 50.6	4 27.4	1.21251	1.27906	7.58	0.8798		
	15	0.7897	2.112	0.011	32 8.1	2 8.5	65 47.4	4 23.2	1.21380	1.27953	7.53	0.8768		
	16	0.7924	+ 2.117	+ 0.013	32 0.4	2 8.0	64 44.2	4 18.9	+1.21475	+1.28003	+ 7.48	+ 0.8736		
	17	0.7952	2.123	0.013	31 53.6	2 7.6	63 41.2	4 14.7	1.21536	1.28054	7.42	0.8703		
	18	0.7979	2.129	0.011	31 48.2	2 7.2	62 38.4	4 10.6	1.21575	1.28106	7.36	0.8668		
	19	0.8006	2.134	0.008	31 44.9	2 7.0	61 35.5	4 6.4	1.21603	1.28160	7.30	0.8631		
	h (2.0)	20	0.8034	+ 2.140	+ 0.004	31 43.5	2 6.9	60 32.9	4 2.2	1.21626	1.28216	7.23	0.8593	
	21	0.8061	+ 2.146	- 0.001	31 44.2	2 6.9	59 30.4	3 58.0	+1.21657	+1.28272	+ 7.17	+ 0.8553		
	22	0.8089	2.152	0.006	31 46.8	2 7.1	58 28.0	3 53.9	1.21703	1.28329	7.10	0.8512		
	23	0.8116	2.158	0.010	31 50.6	2 7.4	57 25.7	3 49.7	1.21776	1.28387	7.03	0.8468		
	24	0.8143	2.165	0.012	31 55.2	2 7.7	56 23.7	3 45.6	1.21881	1.28447	6.96	0.8423		
	25	0.8171	2.171	0.013	31 59.4	2 8.0	55 21.7	3 41.5	1.22022	1.28508	6.88	0.8376		
	26	0.8198	+ 2.177	- 0.012	32 2.0	2 8.1	54 19.8	3 37.3	+1.22195	+1.28570	+ 6.80	+ 0.8327		
	27	0.8225	2.184	0.009	32 1.9	2 8.1	53 18.1	3 33.2	1.22391	1.28632	6.73	0.8277		
	28	0.8253	2.190	- 0.004	31 58.5	2 7.9	52 16.6	3 29.1	1.22591	1.28695	6.64	0.8224		
	29	0.8280	2.197	+ 0.001	31 51.9	2 7.5	51 15.2	3 25.0	1.22774	1.28758	6.56	0.8169		
	30	0.8308	2.204	0.006	31 43.0	2 6.9	50 13.9	3 20.9	1.22924	1.28822	6.47	0.8112		
Nov.	31	0.8335	+ 2.211	+ 0.008	31 33.3	2 6.2	49 12.8	3 16.9	+1.23033	+1.28887	+ 6.39	+ 0.8053		
	1	0.8362	2.218	0.008	31 24.8	2 5.7	48 11.8	3 12.8	1.23102	1.28952	6.30	0.7992		
	2	0.8390	2.225	0.006	31 19.2	2 5.3	47 11.0	3 8.7	1.23147	1.29017	6.21	0.7929		
	3	0.8417	2.232	+ 0.001	31 17.5	2 5.2	46 10.3	3 4.7	1.23188	1.29082	6.11	0.7863		
	h (3.0)	4	0.8445	2.239	- 0.004	31 19.0	2 5.3	45 9.7	3 0.7	1.23250	1.29149	6.02	0.7795	
	5	0.8472	+ 2.246	- 0.007	31 23.0	2 5.5	44 9.3	2 56.6	+1.23352	+1.29215	+ 5.92	+ 0.7724		
	6	0.8499	2.253	0.009	31 27.7	2 5.8	43 9.1	2 52.6	1.23501	1.29280	5.82	0.7651		
	7	0.8527	2.261	0.008	31 31.2	2 6.1	42 9.0	2 48.6	1.23691	1.29345	5.72	0.7575		
	8	0.8554	2.269	- 0.005	31 32.1	2 6.1	41 9.0	2 44.6	1.23907	1.29410	5.62	0.7496		
	9	0.8581	2.277	0.000	31 29.7	2 6.0	40 9.3	2 40.6	1.24127	1.29475	5.52	0.7415		
	10	0.8609	+ 2.285	+ 0.005	31 24.5	2 5.6	39 9.7	2 36.6	+1.24333	+1.29541	+ 5.41	+ 0.7330		
	11	0.8636	2.293	0.010	31 17.4	2 5.2	38 10.2	2 32.7	1.24511	1.29605	5.30	0.7243		
	12	0.8664	2.301	0.012	31 9.4	2 4.6	37 10.8	2 28.7	1.24653	1.29668	5.19	0.7152		
	13	0.8691	2.309	0.013	31 1.8	2 4.1	36 11.7	2 24.8	1.24763	1.29732	5.08	0.7058		
	14	0.8718	2.317	0.012	30 55.3	2 3.7	35 12.6	2 20.8	1.24845	1.29793	4.97	0.6961		
	15	0.8746	+ 2.325	+ 0.009	30 50.6	2 3.4	34 13.8	2 16.9	+1.24914	+1.29855	+ 4.85	+ 0.6860		
	16	0.8773	+ 2.334	+ 0.005	30 47.7	2 3.2	33 15.0	2 13.0	+1.24975	+1.29917	+ 4.74	+ 0.6755		

(CONSTANTS OF PARIS CONFERENCE.)

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	$\tau$	$f'$		$f''$		$G$		$H$		Log $\kappa$ .	Log $h$ .	$i$	Log $i$ .
		In Time.		In Time.		In Arc.	In Time.	In Arc.	In Time.				
	y	s		s		°	h m	°	h m			"	
Nov. 16	0.8773	+ 2.334		+ 0.005		30 47.7	2 3.2	33 15.0	2 13.0	+1.24975	+1.29917	+ 4.74	+ 0.6755
17	0.8800	2.342		+ 0.001		30 46.5	2 3.1	32 16.5	2 9.1	1.25039	1.29977	4.62	0.6646
18	0.8828	2.351		- 0.004		30 47.0	2 3.1	31 18.0	2 5.2	1.25113	1.30036	4.50	0.6532
h 19	0.8855	2.359		0.008		30 48.8	2 3.3	30 19.7	2 1.3	1.25209	1.30094	4.38	0.6415
(4.0) 20	0.8883	2.368		0.012		30 51.3	2 3.4	29 21.5	1 57.4	1.25331	1.30151	4.26	0.6292
21	0.8910	+ 2.377		- 0.013		30 53.8	2 3.6	28 23.5	1 53.6	+1.25484	+1.30207	+ 4.14	+ 0.6165
22	0.8937	2.386		0.012		30 55.1	2 3.7	27 25.5	1 49.7	1.25671	1.30262	4.01	0.6032
23	0.8965	2.395		0.010		30 54.4	2 3.6	26 27.7	1 45.9	1.25879	1.30315	3.89	0.5894
24	0.8992	2.404		- 0.005		30 50.5	2 3.4	25 30.0	1 42.0	1.26098	1.30367	3.76	0.5749
25	0.9019	2.413		0.000		30 43.5	2 2.9	24 32.5	1 38.2	1.26308	1.30418	3.63	0.5599
26	0.9047	+ 2.423		+ 0.005		30 34.0	2 2.3	23 35.0	1 34.3	+1.26492	+1.30468	+ 3.50	+ 0.5441
27	0.9074	2.432		0.008		30 23.1	2 1.5	22 37.6	1 30.5	1.26637	1.30514	3.37	0.5276
28	0.9102	2.442		0.009		30 12.6	2 0.8	21 40.4	1 26.7	1.26742	1.30561	3.24	0.5103
29	0.9129	2.451		0.007		30 4.2	2 0.3	20 43.2	1 22.9	1.26813	1.30606	3.11	0.4921
30	0.9156	2.461		+ 0.003		29 59.0	1 59.9	19 46.2	1 19.1	1.26874	1.30649	2.97	0.4730
Dec. 1	0.9184	+ 2.470		- 0.002		29 57.2	1 59.8	18 49.2	1 15.3	+1.26942	+1.30690	+ 2.84	+ 0.4528
2	0.9211	2.480		0.006		29 58.0	1 59.9	17 52.3	1 11.5	1.27040	1.30730	2.70	0.4315
3	0.9238	2.490		0.009		30 0.1	2 0.0	16 55.5	1 7.7	1.27180	1.30768	2.56	0.4090
4	0.9266	2.500		0.009		30 1.7	2 0.1	15 58.7	1 3.9	1.27360	1.30804	2.43	0.3851
h 5	0.9293	2.510		0.007		30 1.1	2 0.1	15 2.1	1 0.1	1.27568	1.30838	2.29	0.3596
(5.0) 6	0.9321	+ 2.520		- 0.003		29 57.7	1 59.8	14 5.5	0 56.4	+1.27790	+1.30871	+ 2.15	+ 0.3324
7	0.9348	2.530		+ 0.003		29 51.3	1 59.4	13 9.0	0 52.6	1.28003	1.30901	2.01	0.3032
8	0.9375	2.540		0.008		29 42.6	1 58.8	12 12.5	0 48.8	1.28196	1.30929	1.87	0.2718
9	0.9403	2.550		0.011		29 32.6	1 58.2	11 16.1	0 45.1	1.28356	1.30956	1.73	0.2377
10	0.9430	2.560		0.013		29 22.6	1 57.5	10 19.7	0 41.3	1.28482	1.30980	1.59	0.2006
11	0.9458	+ 2.570		+ 0.012		29 13.4	1 56.9	9 23.4	0 37.6	+1.28582	+1.31003	+ 1.45	+ 0.1599
12	0.9485	2.580		0.010		29 5.5	1 56.4	8 27.2	0 33.8	1.28661	1.31023	1.30	0.1148
13	0.9512	2.590		0.006		28 59.4	1 56.0	7 31.0	0 30.1	1.28729	1.31042	1.16	0.0643
14	0.9540	2.601		+ 0.002		28 54.9	1 55.7	6 34.8	0 26.3	1.28794	1.31058	1.02	0.0070
15	0.9567	2.611		- 0.003		28 51.9	1 55.5	5 38.7	0 22.5	1.28865	1.31072	0.87	9.9408
16	0.9594	+ 2.621		- 0.007		28 50.3	1 55.3	4 42.6	0 18.9	+1.28952	+1.31084	+ 0.73	+ 9.8624
17	0.9622	2.632		0.011		28 49.6	1 55.3	3 46.5	0 15.1	1.29059	1.31094	0.58	9.7666
18	0.9649	2.642		0.013		28 49.1	1 55.3	2 50.4	0 11.4	1.29192	1.31101	0.44	9.6433
19	0.9677	2.652		0.013		28 48.0	1 55.2	1 54.3	0 7.6	1.29353	1.31107	0.30	9.4702
h 20	0.9704	2.663		0.011		28 45.2	1 55.0	0 58.3	0 3.9	1.29541	1.31110	0.15	9.1777
(6.0) 21	0.9731	+ 2.673		- 0.007		28 40.1	1 54.7	0 2.2	0 0.1	+1.29742	+1.31112	+ 0.01	+ 7.7624
22	0.9759	2.684		- 0.002		28 32.0	1 54.1	359 6.2	23 56.4	1.29941	1.31110	- 0.14	- 9.1430
23	0.9786	2.694		+ 0.004		28 21.2	1 53.4	358 10.1	23 52.7	1.30122	1.31107	0.28	9.4529
24	0.9813	2.704		0.008		28 8.7	1 52.6	357 14.0	23 48.9	1.30270	1.31103	0.43	9.6319
25	0.9841	2.715		0.010		27 55.9	1 51.7	356 17.9	23 45.2	1.30380	1.31095	0.57	9.7582
26	0.9868	+ 2.725		+ 0.009		27 44.5	1 51.0	355 21.8	23 41.5	+1.30456	+1.31085	- 0.72	- 9.8558
27	0.9896	2.735		0.006		27 35.6	1 50.4	354 25.6	23 37.7	1.30507	1.31073	0.86	9.9353
28	0.9923	2.746		+ 0.001		27 29.9	1 50.0	353 29.4	23 34.0	1.30556	1.31059	1.01	0.0024
29	0.9950	2.756		- 0.004		27 27.3	1 49.8	352 33.1	23 30.2	1.30623	1.31043	1.15	0.0604
30	0.9978	2.766		0.008		27 26.4	1 49.8	351 36.8	23 26.5	1.30722	1.31025	1.29	0.1114
31	1.0005	+ 2.777		- 0.009		27 25.9	1 49.7	350 40.4	23 22.7	+1.30858	+1.31005	- 1.44	- 0.1570
32	1.0032	+ 2.787		- 0.008		27 23.9	1 49.6	349 44.0	23 18.9	+1.31027	+1.30982	- 1.58	- 0.1981

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

α Ursæ Min. (Polaris).			51 Cephei (Hev.).			δ Ursæ Min			λ Ursæ Min.			σ Octantis.		
Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion South.
Jan.	h m 1 24	° +88 47	Jan.	h m 6 56	° +87 11	Jan.	h m 18 2	° +86 36	Jan.	h m 19 16	° +88 59	Jan.	h m 19 4	° -89 14
	s	"		s	"		s	"		s	"		s	"
0.3	59.72	58.2	0.5	7.30	49.8	0.9	51.78	56.2	1.0	50.90	56.5	1.0	34.45	47.7
1.3	58.82	58.3	1.5	7.46	50.1	1.9	51.73	55.8	2.0	50.32	56.1	2.0	34.86	47.3
2.3	57.88	58.5	2.5	7.64	50.4	2.9	51.70	55.5	3.0	49.78	55.8	3.0	35.31	47.0
3.3	56.88	58.6	3.5	7.81	50.7	3.9	51.70	55.1	4.0	49.29	55.5	4.0	35.77	46.7
4.3	55.81	58.8	4.5	7.96	51.1	4.9	51.70	54.7	5.0	48.87	55.1	5.0	36.18	46.4
5.3	54.70	58.9	5.5	8.06	51.4	5.9	51.73	54.3	6.0	48.52	54.7	5.9	36.54	46.1
6.3	53.58	59.0	6.5	8.14	51.8	6.9	51.80	54.0	7.0	48.27	54.4	6.9	36.86	45.7
7.3	52.47	59.0	7.5	8.18	52.1	7.9	51.89	53.6	8.0	48.10	54.0	7.9	37.13	45.4
8.3	51.39	59.1	8.5	8.21	52.5	8.9	51.99	53.3	8.9	47.97	53.7	8.9	37.39	45.1
9.3	50.34	59.1	9.5	8.21	52.8	9.9	52.07	53.0	9.9	47.88	53.4	9.9	37.68	44.7
10.2	49.37	59.2	10.5	8.22	53.1	10.9	52.16	52.7	10.9	47.80	53.1	10.9	38.02	44.4
11.2	48.43	59.2	11.5	8.24	53.4	11.9	52.25	52.4	11.9	47.68	52.8	11.9	38.46	44.0
12.2	47.52	59.2	12.5	8.26	53.7	12.9	52.33	52.1	12.9	47.56	52.5	12.9	39.02	43.6
13.2	46.62	59.3	13.5	8.29	54.0	13.9	52.39	51.8	13.9	47.38	52.2	13.9	39.67	43.3
14.2	45.69	59.4	14.5	8.33	54.3	14.9	52.46	51.5	14.9	47.19	51.9	14.9	40.41	42.9
15.2	44.71	59.4	15.5	8.37	54.6	15.9	52.53	51.1	15.9	46.99	51.6	15.9	41.21	42.6
16.2	43.68	59.5	16.5	8.40	54.9	16.9	52.61	50.8	16.9	46.85	51.2	16.9	42.04	42.3
17.2	42.56	59.5	17.5	8.41	55.2	17.9	52.71	50.4	17.9	46.75	50.8	17.9	42.85	42.0
18.2	41.42	59.6	18.5	8.39	55.6	18.9	52.85	50.1	18.9	46.73	50.5	18.9	43.61	41.7
19.2	40.25	59.6	19.5	8.35	56.0	19.9	53.01	49.7	19.9	46.79	50.1	19.9	44.31	41.4
20.2	39.08	59.6	20.4	8.28	56.3	20.9	53.18	49.4	20.9	46.95	49.8	20.9	44.96	41.1
21.2	37.94	59.5	21.4	8.18	56.7	21.9	53.38	49.0	21.9	47.18	49.4	21.9	45.59	40.8
22.2	36.85	59.5	22.4	8.05	57.0	22.9	53.59	48.7	22.9	47.44	49.1	22.9	46.22	40.5
23.2	35.82	59.4	23.4	7.93	57.3	23.9	53.78	48.5	23.9	47.71	48.7	23.9	46.90	40.1
24.2	34.85	59.3	24.4	7.81	57.6	24.9	53.97	48.2	24.9	47.98	48.4	24.9	47.66	39.8
25.2	33.91	59.3	25.4	7.69	57.9	25.9	54.14	47.9	25.9	48.22	48.1	25.9	48.53	39.4
26.2	33.01	59.2	26.4	7.59	58.1	26.9	54.30	47.7	26.9	48.40	47.8	26.9	49.51	39.1
27.2	32.11	59.2	27.4	7.51	58.4	27.9	54.46	47.4	27.9	48.56	47.6	27.9	50.61	38.7
28.2	31.18	59.2	28.4	7.43	58.7	28.9	54.60	47.1	28.9	48.69	47.3	28.9	51.80	38.4
29.2	30.22	59.1	29.4	7.37	59.0	29.9	54.76	46.8	29.9	48.80	47.0	29.9	53.05	38.1
30.2	29.20	59.1	30.4	7.29	59.3	30.9	54.92	46.5	30.9	48.97	46.6	30.9	54.31	37.8
31.2	28.13	59.1	31.4	7.20	59.6	31.9	55.10	46.2	31.9	49.19	46.3	31.9	55.54	37.5
32.2	27.03	59.0	32.4	7.08	60.0	32.9	55.32	45.9	32.9	49.49	45.9	32.9	56.72	37.3

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

α Ursæ Min. (Polaris).			51 Cephei (Hev.).			δ Ursæ Min.			λ Ursæ Min.			σ Octantis.		
Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion South.
Feb.	h m 1 24	° +88 47	Feb.	h m 6 55	° +87 12	Feb.	h m 18 2	° +86 36	Feb.	h m 19 16	° +88 59	Feb.	h m 19 4	° -89 14
	s	"		s	"		s	"		s	"		s	"
1.2	27.03	59.0	1.4	67.08	0.0	1.9	55.32	45.9	1.9	49.49	45.9	1.9	56.72	37.3
2.2	25.90	58.9	2.4	66.93	0.3	2.9	55.56	45.6	2.9	49.88	45.6	2.9	57.84	37.0
3.2	24.80	58.8	3.4	66.73	0.6	3.9	55.81	45.3	3.9	50.36	45.2	3.9	58.91	36.7
4.2	23.74	58.7	4.4	66.52	0.9	4.9	56.09	45.0	4.9	50.90	44.9	4.9	59.94	36.5
5.2	22.72	58.6	5.4	66.29	1.2	5.9	56.36	44.8	5.9	51.48	44.6	5.9	60.97	36.2
6.2	21.78	58.5	6.4	66.05	1.5	6.9	56.65	44.5	6.9	52.08	44.3	6.9	62.03	35.9
7.2	20.89	58.3	7.4	65.82	1.8	7.9	56.91	44.3	7.9	52.65	44.0	7.9	63.18	35.6
8.2	20.03	58.2	8.4	65.60	2.0	8.9	57.16	44.1	8.9	53.20	43.8	8.9	64.43	35.3
9.2	19.20	58.0	9.4	65.39	2.2	9.9	57.40	43.9	9.9	53.71	43.5	9.9	65.78	34.9
10.2	18.37	57.9	10.4	65.18	2.5	10.9	57.62	43.7	10.9	54.20	43.3	10.9	67.21	34.6
11.2	17.51	57.8	11.4	64.99	2.8	11.9	57.86	43.5	11.9	54.66	43.0	11.9	68.70	34.4
12.2	16.62	57.7	12.4	64.79	3.0	12.9	58.11	43.2	12.9	55.15	42.7	12.9	70.23	34.1
13.2	15.66	57.6	13.4	64.58	3.3	13.9	58.37	43.0	13.9	55.69	42.4	13.9	71.75	33.9
14.2	14.67	57.4	14.4	64.35	3.6	14.9	58.65	42.7	14.9	56.28	42.1	14.9	73.22	33.6
15.1	13.65	57.3	15.4	64.09	3.9	15.9	58.96	42.5	15.9	56.95	41.8	15.9	74.63	33.4
16.1	12.62	57.1	16.4	63.80	4.2	16.8	59.30	42.2	16.9	57.71	41.5	16.9	75.98	33.2
17.1	11.63	56.9	17.4	63.48	4.5	17.8	59.64	42.0	17.9	58.54	41.2	17.9	77.28	33.0
18.1	10.69	56.7	18.4	63.15	4.7	18.8	59.99	41.8	18.9	59.42	40.9	18.9	78.56	32.8
19.1	9.81	56.5	19.4	62.80	5.0	19.8	60.34	41.7	19.9	60.33	40.6	19.9	79.85	32.5
20.1	9.00	56.3	20.4	62.47	5.2	20.8	60.67	41.5	20.9	61.22	40.4	20.9	81.19	32.2
21.1	8.25	56.0	21.4	62.13	5.4	21.8	61.00	41.4	21.9	62.09	40.2	21.9	82.63	32.0
22.1	7.56	55.8	22.4	61.81	5.6	22.8	61.31	41.2	22.9	62.91	40.0	22.9	84.17	31.7
23.1	6.89	55.6	23.4	61.51	5.8	23.8	61.60	41.1	23.9	63.67	39.7	23.9	85.82	31.5
24.1	6.20	55.4	24.3	61.23	5.9	24.8	61.89	41.0	24.9	64.40	39.5	24.9	87.56	31.2
25.1	5.50	55.2	25.3	60.94	6.1	25.8	62.18	40.8	25.9	65.11	39.3	25.9	89.36	31.0
26.1	4.76	55.1	26.3	60.66	6.4	26.8	62.47	40.6	26.9	65.83	39.1	26.9	91.19	30.8
27.1	3.98	54.9	27.3	60.38	6.6	27.8	62.77	40.5	27.9	66.59	38.8	27.8	93.00	30.6
28.1	3.16	54.7	28.3	60.06	6.8	28.8	63.10	40.3	28.9	67.42	38.5	28.8	94.74	30.4
29.1	2.33	54.5	29.3	59.73	7.0	29.8	63.47	40.1	29.9	68.33	38.3	29.8	96.42	30.3
30.1	1.51	54.2	30.3	59.36	7.3	30.8	63.84	40.0	30.9	69.33	38.0	30.8	98.03	30.1

**CIRCUMPOLAR STARS.**

**APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.**

Mean Solar Date.	$\alpha$ Ursæ Min. (Polaris).			Mean Solar Date.	$\gamma$ Cephei (HEV.).			Mean Solar Date.	$\delta$ Ursæ Min.			Mean Solar Date.	$\lambda$ Ursæ Min.			Mean Solar Date.	$\sigma$ Octantis.		
	Right Ascension.	Declina- tion North.			Right Ascension.	Declina- tion North.			Right Ascension.	Declina- tion North.			Right Ascension.	Declina- tion North.			Right Ascension.	Declina- tion South.	
Mar.	h m 1 23	° +88 47		Mar.	h m 6 55	° +87 12		Mar.	h m 18 3	° +86 36		Mar.	h m 19 17	° +88 59		Mar.	h m 19 5	° -89 14	
	s "				s "				s "				s "				s "		
1.1	61.51	54.2		1.3	59.36	7.3		1.8	3.84	40.0		1.9	9.33	38.0		1.9	38.03	30.1	
2.1	60.72	54.0		2.3	58.98	7.5		2.8	4.22	39.8		2.9	10.38	37.8		2.9	39.60	29.9	
3.1	60.00	53.7		3.3	58.57	7.7		3.8	4.61	39.7		3.9	11.48	37.6		3.9	41.14	29.8	
4.1	59.35	53.4		4.3	58.16	7.8		4.8	4.98	39.6		4.9	12.58	37.4		4.9	42.69	29.6	
5.1	58.77	53.1		5.3	57.75	8.0		5.8	5.35	39.6		5.8	13.68	37.2		5.9	44.29	29.4	
6.1	58.24	52.8		6.3	57.36	8.1		6.8	5.71	39.5		6.8	14.73	37.1		6.9	45.97	29.1	
7.1	57.74	52.6		7.3	56.97	8.2		7.8	6.05	39.5		7.8	15.74	36.9		7.9	47.73	28.9	
8.1	57.27	52.3		8.3	56.59	8.3		8.8	6.38	39.4		8.8	16.71	36.8		8.9	49.57	28.7	
9.1	56.79	52.1		9.3	56.24	8.4		9.8	6.71	39.3		9.8	17.65	36.6		9.8	51.49	28.6	
10.1	56.28	51.8		10.3	55.90	8.6		10.8	7.03	39.3		10.8	18.57	36.5		10.8	53.44	28.4	
11.1	55.74	51.6		11.3	55.54	8.7		11.8	7.37	39.2		11.8	19.54	36.3		11.8	55.39	28.3	
12.1	55.16	51.3		12.3	55.17	8.9		12.8	7.72	39.1		12.8	20.55	36.2		12.8	57.30	28.2	
13.1	54.56	51.1		13.3	54.78	9.0		13.8	8.09	39.0		13.8	21.63	36.0		13.8	59.13	28.1	
14.1	53.93	50.8		14.3	54.36	9.2		14.8	8.48	38.9		14.8	22.78	35.8		14.8	60.87	28.0	
15.1	53.33	50.5		15.3	53.92	9.3		15.8	8.89	38.8		15.8	24.01	35.6		15.8	62.54	27.9	
16.1	52.79	50.2		16.3	53.46	9.5		16.8	9.32	38.8		16.8	25.28	35.5		16.8	64.18	27.8	
17.1	52.30	49.8		17.3	52.99	9.6		17.8	9.74	38.8		17.8	26.58	35.3		17.8	65.81	27.6	
18.1	51.91	49.5		18.3	52.52	9.6		18.8	10.14	38.8		18.8	27.85	35.2		18.8	67.47	27.5	
19.1	51.57	49.1		19.3	52.06	9.7		19.8	10.52	38.8		19.8	29.10	35.2		19.8	69.19	27.4	
20.1	51.30	48.8		20.3	51.61	9.7		20.8	10.87	38.9		20.8	30.30	35.1		20.8	71.01	27.2	
21.1	51.06	48.5		21.3	51.19	9.8		21.8	11.22	38.9		21.8	31.43	35.0		21.8	72.92	27.1	
22.0	50.83	48.2		22.3	50.80	9.8		22.7	11.56	38.9		22.8	32.51	34.9		22.8	74.93	26.9	
23.0	50.59	48.0		23.3	50.41	9.9		23.7	11.87	38.9		23.8	33.56	34.9		23.8	77.00	26.8	
24.0	50.34	47.7		24.3	50.04	9.9		24.7	12.20	39.0		24.8	34.58	34.8		24.8	79.09	26.7	
25.0	50.05	47.4		25.3	49.66	10.0		25.7	12.53	39.0		25.8	35.63	34.7		25.8	81.15	26.7	
26.0	49.72	47.1		26.3	49.27	10.0		26.7	12.88	39.0		26.8	36.72	34.6		26.8	83.18	26.6	
27.0	49.38	46.8		27.3	48.87	10.1		27.7	13.24	39.0		27.8	37.87	34.5		27.8	85.13	26.6	
28.0	49.02	46.5		28.3	48.43	10.2		28.7	13.62	39.0		28.8	39.09	34.4		28.8	86.99	26.5	
29.0	48.71	46.2		29.3	47.98	10.3		29.7	14.02	39.0		29.8	40.37	34.3		29.8	88.78	26.5	
30.0	48.46	45.9		30.3	47.51	10.3		30.7	14.41	39.0		30.8	41.69	34.3		30.8	90.53	26.5	
31.0	48.26	45.5		31.3	47.04	10.3		31.7	14.81	39.1		31.8	43.02	34.2		31.8	92.26	26.4	
32.0	48.15	45.2		32.2	46.56	10.3		32.7	15.18	39.2		32.8	44.34	34.2		32.8	94.02	26.3	

### APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

**CIRCUMPOLAR STARS.**

**APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.**

Mean Solar Date.	<i>α</i> Ursæ Min. ( <i>Polaris</i> ).		Mean Solar Date.	51 Cephei (Hev.).		Mean Solar Date.	<i>δ</i> Ursæ Min.		Mean Solar Date.	<i>λ</i> Ursæ Min.		Mean Solar Date.	<i>σ</i> Octantis.	
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion South.
May	h m 1 23	° ' " +88 47	May	h m 6 55	° ' " +87 12	May	h m 18 3	° ' " +86 36	May	h m 19 18	° ' " +88 59	May	h m 19 7	° ' " -89 14
	s	"		s	"		s	"		s	"		s	"
1.9	53.54	35.7	1.2	34.40	7.8	1.6	24.51	44.0	1.7	19.38	36.1	1.7	29.68	26.9
2.9	54.07	35.4	2.2	34.08	7.6	2.6	24.72	44.3	2.7	20.35	36.3	2.7	31.55	27.0
3.9	54.58	35.2	3.2	33.77	7.4	3.6	24.92	44.5	3.7	21.27	36.4	3.7	33.43	27.1
4.9	55.05	35.0	4.2	33.47	7.2	4.6	25.13	44.8	4.7	22.17	36.6	4.7	35.32	27.2
5.9	55.48	34.7	5.2	33.18	7.0	5.6	25.34	45.0	5.7	23.08	36.7	5.7	37.19	27.3
6.9	55.89	34.5	6.2	32.88	6.9	6.6	25.57	45.2	6.7	24.01	36.9	6.7	38.98	27.5
7.9	56.28	34.2	7.1	32.57	6.7	7.6	25.81	45.4	7.7	24.99	37.0	7.7	40.66	27.6
8.9	56.70	33.9	8.1	32.23	6.6	8.6	26.05	45.6	8.7	26.03	37.2	8.7	42.25	27.8
9.9	57.18	33.6	9.1	31.89	6.4	9.6	26.30	45.8	9.7	27.10	37.3	9.6	43.76	28.0
10.9	57.73	33.4	10.1	31.53	6.2	10.6	26.56	46.1	10.7	28.20	37.5	10.6	45.21	28.1
11.9	58.35	33.1	11.1	31.18	6.0	11.6	26.80	46.4	11.7	29.30	37.7	11.6	46.63	28.2
12.9	59.03	32.8	12.1	30.83	5.8	12.6	27.04	46.7	12.7	30.35	37.9	12.6	48.07	28.3
13.9	59.77	32.5	13.1	30.50	5.6	13.6	27.24	47.0	13.6	31.35	38.1	13.6	49.57	28.5
14.9	60.53	32.3	14.1	30.20	5.3	14.6	27.41	47.3	14.6	32.27	38.4	14.6	51.14	28.6
15.9	61.30	32.1	15.1	29.93	5.0	15.6	27.57	47.6	15.6	33.11	38.6	15.6	52.78	28.7
16.9	62.04	31.9	16.1	29.69	4.8	16.6	27.70	47.9	16.6	33.86	38.8	16.6	54.48	28.8
17.9	62.76	31.7	17.1	29.47	4.5	17.6	27.82	48.2	17.6	34.56	39.1	17.6	56.20	29.0
18.9	63.41	31.5	18.1	29.27	4.3	18.6	27.93	48.5	18.6	35.24	39.3	18.6	57.94	29.1
19.9	64.05	31.3	19.1	29.07	4.1	19.6	28.06	48.7	19.6	35.93	39.5	19.6	59.64	29.3
20.9	64.66	31.1	20.1	28.86	3.9	20.6	28.19	49.0	20.6	36.64	39.7	20.6	61.26	29.6
21.9	65.27	31.0	21.1	28.63	3.7	21.6	28.33	49.2	21.6	37.38	39.9	21.6	62.77	29.8
22.9	65.92	30.8	22.1	28.40	3.5	22.6	28.49	49.5	22.6	38.18	40.1	22.6	64.20	30.0
23.9	66.61	30.5	23.1	28.14	3.2	23.6	28.65	49.8	23.6	39.02	40.3	23.6	65.53	30.2
24.9	67.37	30.3	24.1	27.89	3.0	24.6	28.80	50.1	24.6	39.86	40.5	24.6	66.80	30.4
25.9	68.19	30.1	25.1	27.63	2.7	25.6	28.95	50.4	25.6	40.69	40.8	25.6	68.03	30.6
26.9	69.08	29.9	26.1	27.39	2.4	26.6	29.07	50.7	26.6	41.48	41.1	26.6	69.28	30.8
27.9	70.00	29.7	27.1	27.17	2.1	27.6	29.18	51.1	27.6	42.21	41.4	27.6	70.58	30.9
28.9	70.95	29.5	28.1	26.98	1.9	28.6	29.28	51.4	28.6	42.86	41.7	28.6	71.94	31.1
29.9	71.88	29.4	29.1	26.81	1.5	29.6	29.34	51.7	29.6	43.44	42.0	29.6	73.35	31.3
30.9	72.79	29.2	30.1	26.66	1.2	30.6	29.38	52.1	30.6	43.96	42.3	30.6	74.79	31.5
31.9	73.64	29.1	31.1	26.53	1.0	31.6	29.43	52.4	31.6	44.42	42.5	31.6	76.23	31.7
32.9	74.44	29.0	32.1	26.42	0.7	32.6	29.46	52.7	32.6	44.88	42.8	32.6	77.65	31.9



CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Ursæ Min. (Polaris).		Mean Solar Date.	51 Cephei (Hév.).		Mean Solar Date.	$\delta$ Ursæ Min.		Mean Solar Date.	$\lambda$ Ursæ Min.		Mean Solar Date.	$\sigma$ Octantis.	
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion South.
June	h m	° '	June	h m	° '	June	h m	° '	June	h m	° '	June	h m	° '
	1 24	+88 47		6 55	+87 11		18 3	+86 36		19 18	+88 59		19 8	-89 14
	s	"		s	"		s	"		s	"		s	"
1.9	14.44	29.0	1.1	26.42	60.7	1.6	29.46	52.7	1.6	44.88	42.8	1.6	17.65	31.9
2.9	15.20	28.9	2.1	26.30	60.4	2.6	29.52	52.9	2.6	45.37	43.1	2.6	19.01	32.1
3.8	15.95	28.7	3.1	26.16	60.2	3.5	29.58	53.2	3.6	45.89	43.3	3.6	20.28	32.4
4.8	16.70	28.6	4.1	26.02	60.0	4.5	29.66	53.5	4.6	46.45	43.5	4.6	21.42	32.7
5.8	17.48	28.4	5.1	25.87	59.7	5.5	29.75	53.8	5.6	47.05	43.8	5.6	22.47	32.9
6.8	18.33	28.3	6.1	25.70	59.4	6.5	29.83	54.1	6.6	47.67	44.0	6.6	23.44	33.2
7.8	19.23	28.1	7.1	25.52	59.1	7.5	29.92	54.4	7.6	48.30	44.3	7.6	24.35	33.4
8.8	20.20	27.9	8.1	25.35	58.8	8.5	29.98	54.8	8.6	48.90	44.6	8.6	25.26	33.7
9.8	21.21	27.8	9.1	25.20	58.5	9.5	30.03	55.1	9.6	49.44	45.0	9.6	26.20	33.9
10.8	22.27	27.7	10.1	25.08	58.2	10.5	30.04	55.5	10.6	49.90	45.3	10.6	27.20	34.1
11.8	23.34	27.6	11.1	24.98	57.9	11.5	30.03	55.8	11.6	50.27	45.6	11.6	28.27	34.3
12.8	24.37	27.5	12.1	24.93	57.5	12.5	30.00	56.2	12.6	50.55	46.0	12.6	29.40	34.5
13.8	25.39	27.4	13.0	24.90	57.2	13.5	29.96	56.5	13.6	50.77	46.3	13.6	30.56	34.8
14.8	26.35	27.4	14.0	24.89	56.9	14.5	29.90	56.8	14.6	50.93	46.6	14.6	31.73	35.0
15.8	27.25	27.4	15.0	24.88	56.6	15.5	29.85	57.1	15.6	51.10	46.9	15.6	32.86	35.3
16.8	28.13	27.3	16.0	24.88	56.3	16.5	29.79	57.4	16.6	51.29	47.2	16.6	33.92	35.6
17.8	28.98	27.2	17.0	24.87	56.1	17.5	29.76	57.7	17.6	51.49	47.5	17.5	34.88	35.9
18.8	29.85	27.2	18.0	24.84	55.8	18.5	29.74	58.0	18.6	51.74	47.7	18.5	35.74	36.3
19.8	30.77	27.1	19.0	24.78	55.5	19.5	29.72	58.3	19.6	52.03	48.0	19.5	36.50	36.6
20.8	31.73	27.0	20.0	24.73	55.2	20.5	29.71	58.6	20.6	52.34	48.3	20.5	37.17	36.9
21.8	32.75	26.9	21.0	24.68	54.9	21.5	29.68	58.9	21.6	52.64	48.6	21.5	37.79	37.1
22.8	33.83	26.9	22.0	24.64	54.6	22.5	29.65	59.3	22.6	52.90	48.9	22.5	38.40	37.4
23.8	34.95	26.8	23.0	24.61	54.2	23.5	29.58	59.6	23.6	53.11	49.3	23.5	39.05	37.6
24.8	36.09	26.8	24.0	24.59	53.9	24.5	29.50	60.0	24.6	53.26	49.6	24.5	39.75	37.9
25.8	37.22	26.8	25.0	24.63	53.6	25.5	29.40	60.3	25.5	53.31	50.0	25.5	40.47	38.1
26.8	38.32	26.8	26.0	24.69	53.2	26.5	29.27	60.7	26.5	53.32	50.4	26.5	41.26	38.4
27.8	39.37	26.8	27.0	24.75	52.9	27.5	29.14	61.0	27.5	53.24	50.7	27.5	42.05	38.7
28.8	40.35	26.8	28.0	24.84	52.6	28.5	29.02	61.3	28.5	53.14	51.0	28.5	42.82	39.0
29.8	41.29	26.8	29.0	24.93	52.3	29.5	28.89	61.6	29.5	53.06	51.3	29.5	43.53	39.3
30.8	42.20	26.8	30.0	25.02	52.0	30.5	28.78	61.8	30.5	52.99	51.6	30.5	44.15	39.6
31.8	43.09	26.8	31.0	25.09	51.7	31.5	28.67	62.1	31.5	52.96	51.9	31.5	44.65	39.9

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Ursæ Min. (Polaris).		Mean Solar Date.	$\gamma$ Cephei (Hæv.).		Mean Solar Date.	$\delta$ Ursæ Min.		Mean Solar Date.	$\lambda$ Ursæ Min.		Mean Solar Date.	$\sigma$ Octantis.	
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion South.
July	h m 1 24	° +88 47	July	h m 6 55	° +87 11	July	h m 18 3	° +86 37	July	h m 19 18	° +88 59	July	h m 19 8	° -89 14
	s	"		s	"		s	"		s	"		s	"
1.8	43.09	26.8	1.0	25.09	51.7	1.5	28.67	2.1	1.5	52.96	51.9	1.5	44.65	39.9
2.8	44.01	26.8	2.0	25.14	51.4	2.5	28.58	2.4	2.5	52.98	52.2	2.5	45.05	40.3
3.8	44.97	26.8	3.0	25.18	51.2	3.5	28.50	2.7	3.5	53.04	52.5	3.5	45.35	40.6
4.8	45.97	26.8	4.0	25.21	50.9	4.5	28.41	3.0	4.5	53.10	52.8	4.5	45.57	40.9
5.8	47.03	26.8	5.0	25.24	50.5	5.5	28.30	3.3	5.5	53.15	53.1	5.5	45.75	41.2
6.8	48.14	26.8	5.9	25.29	50.2	6.5	28.18	3.6	6.5	53.13	53.5	6.5	45.95	41.5
7.8	49.30	26.8	6.9	25.37	49.9	7.5	28.03	4.0	7.5	53.05	53.8	7.5	46.21	41.7
8.8	50.47	26.9	7.9	25.48	49.5	8.5	27.86	4.3	8.5	52.89	54.2	8.5	46.51	42.0
9.8	51.61	26.9	8.9	25.61	49.2	9.5	27.66	4.6	9.5	52.63	54.6	9.5	46.87	42.3
10.7	52.72	27.0	9.9	25.78	48.8	10.5	27.45	4.9	10.5	52.29	54.9	10.5	47.27	42.6
11.7	53.79	27.1	10.9	25.97	48.5	11.5	27.23	5.2	11.5	51.91	55.3	11.5	47.69	42.9
12.7	54.77	27.2	11.9	26.17	48.2	12.4	27.01	5.5	12.5	51.50	55.6	12.5	48.10	43.2
13.7	55.71	27.3	12.9	26.38	47.9	13.4	26.79	5.8	13.5	51.10	55.9	13.5	48.43	43.5
14.7	56.63	27.4	13.9	26.57	47.6	14.4	26.58	6.0	14.5	50.72	56.2	14.5	48.67	43.9
15.7	57.54	27.5	14.9	26.75	47.4	15.4	26.39	6.2	15.5	50.38	56.5	15.5	48.80	44.2
16.7	58.47	27.6	15.9	26.92	47.1	16.4	26.21	6.5	16.5	50.09	56.8	16.5	48.82	44.6
17.7	59.46	27.6	16.9	27.08	46.8	17.4	26.03	6.7	17.5	49.82	57.1	17.5	48.75	44.9
18.7	60.49	27.7	17.9	27.22	46.6	18.4	25.84	7.0	18.5	49.55	57.4	18.5	48.61	45.2
19.7	61.56	27.8	18.9	27.38	46.2	19.4	25.65	7.3	19.5	49.25	57.7	19.5	48.44	45.5
20.7	62.68	27.9	19.9	27.55	45.9	20.4	25.44	7.6	20.5	48.93	58.0	20.5	48.29	45.8
21.7	63.83	28.0	20.9	27.74	45.6	21.4	25.20	7.9	21.5	48.54	58.4	21.5	48.17	46.0
22.7	64.98	28.1	21.9	27.95	45.2	22.4	24.94	8.2	22.5	48.05	58.8	22.5	48.11	46.3
23.7	66.08	28.2	22.9	28.20	44.9	23.4	24.67	8.5	23.5	47.48	59.1	23.5	48.09	46.6
24.7	67.14	28.4	23.9	28.47	44.6	24.4	24.38	8.8	24.5	46.86	59.4	24.5	48.10	46.8
25.7	68.13	28.6	24.9	28.75	44.3	25.4	24.08	9.1	25.5	46.19	59.8	25.4	48.09	47.2
26.7	69.07	28.7	25.9	29.04	44.0	26.4	23.80	9.3	26.5	45.53	60.1	26.4	48.04	47.5
27.7	69.96	28.9	26.9	29.32	43.8	27.4	23.52	9.5	27.5	44.88	60.3	27.4	47.91	47.8
28.7	70.81	29.1	27.9	29.60	43.5	28.4	23.26	9.7	28.5	44.28	60.6	28.4	47.66	48.2
29.7	71.69	29.2	28.9	29.86	43.3	29.4	23.02	9.9	29.5	43.73	60.9	29.4	47.29	48.5
30.7	72.57	29.3	29.9	30.09	43.0	30.4	22.78	10.1	30.5	43.22	61.1	30.4	46.81	48.8
31.7	73.49	29.4	30.9	30.32	42.8	31.4	22.55	10.4	31.4	42.72	61.4	31.4	46.26	49.1
32.7	74.47	29.6	31.9	30.54	42.5	32.4	22.31	10.6	32.4	42.22	61.7	32.4	45.65	49.4

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

α Ursæ Min. (Polaris).			51 Cephei (Hæv.).			δ Ursæ Min.			ζ Ursæ Min.			σ Octantis		
Mean Solar Date.	Right Ascen- sion.	Declina- tion North.	Mean Solar Date.	Right Ascen- sion.	Declina- tion North.	Mean Solar Date.	Right Ascen- sion.	Declina- tion North.	Mean Solar Date.	Right Ascen- sion.	Declina- tion North.	Mean Solar Date.	Right Ascen- sion.	Declina- tion South.
Aug.	h m 1 25	° +88 47	Aug.	h m 6 55	° +87 11	Aug.	h m 18 3	° +86 37	Aug.	h m 19 18	° +89 0	Aug.	h m 19 8	° -89 14
	s	"		s	"		s	"		s	"		s	"
1.7	14.47	29.6	1.9	30.78	42.2	1.4	22.31	10.6	1.4	42.22	1.7	1.4	45.65	49.4
2.7	15.51	29.7	2.9	31.03	41.9	2.4	22.05	10.9	2.4	41.68	2.0	2.4	45.04	49.7
3.7	16.57	29.9	3.9	31.31	41.6	3.4	21.77	11.1	3.4	41.10	2.4	3.4	44.46	50.0
4.7	17.64	30.0	4.9	31.62	41.3	4.4	21.46	11.4	4.4	40.43	2.7	4.4	43.94	50.2
5.7	18.71	30.2	5.9	31.95	41.0	5.4	21.13	11.6	5.4	39.68	3.0	5.4	43.47	50.5
6.7	19.73	30.5	6.9	32.32	40.7	6.4	20.79	11.9	6.4	38.84	3.4	6.4	43.07	50.7
7.7	20.71	30.7	7.9	32.70	40.4	7.4	20.44	12.1	7.4	37.93	3.7	7.4	42.68	51.0
8.7	21.62	30.9	8.9	33.07	40.2	8.4	20.08	12.3	8.4	37.00	4.0	8.4	42.29	51.3
9.7	22.46	31.2	9.9	33.44	40.0	9.4	19.72	12.5	9.4	36.06	4.2	9.4	41.85	51.6
10.7	23.27	31.4	10.9	33.81	39.8	10.4	19.38	12.6	10.4	35.14	4.5	10.4	41.35	51.9
11.7	24.05	31.6	11.9	34.15	39.6	11.4	19.05	12.8	11.4	34.26	4.7	11.4	40.73	52.2
12.7	24.84	31.8	12.9	34.48	39.3	12.4	18.73	13.0	12.4	33.43	5.0	12.4	40.00	52.5
13.7	25.68	32.0	13.9	34.80	39.1	13.4	18.43	13.1	13.4	32.64	5.2	13.4	39.16	52.8
14.7	26.53	32.2	14.9	35.12	38.9	14.4	18.12	13.3	14.4	31.86	5.5	14.4	38.26	53.1
15.6	27.45	32.4	15.9	35.44	38.6	15.4	17.81	13.5	15.4	31.08	5.7	15.4	37.32	53.4
16.6	28.40	32.7	16.9	35.79	38.4	16.3	17.48	13.7	16.4	30.25	6.0	16.4	36.37	53.6
17.6	29.39	32.9	17.9	36.16	38.1	17.3	17.13	13.9	17.4	29.37	6.3	17.4	35.47	53.9
18.6	30.37	33.1	18.9	36.56	37.8	18.3	16.76	14.1	18.4	28.43	6.6	18.4	34.61	54.1
19.6	31.32	33.4	19.9	36.99	37.6	19.3	16.37	14.3	19.4	27.40	6.9	19.4	33.80	54.3
20.6	32.22	33.7	20.9	37.41	37.3	20.3	15.98	14.5	20.4	26.31	7.2	20.4	33.04	54.5
21.6	33.06	34.0	21.9	37.86	37.1	21.3	15.58	14.7	21.4	25.19	7.5	21.4	32.27	54.8
22.6	33.84	34.3	22.9	38.31	36.9	22.3	15.18	14.8	22.4	24.04	7.7	22.4	31.47	55.0
23.6	34.55	34.5	23.9	38.74	36.7	23.3	14.79	14.9	23.4	22.90	7.9	23.4	30.62	55.3
24.6	35.21	34.8	24.8	39.16	36.6	24.3	14.41	15.0	24.4	21.81	8.1	24.4	29.67	55.6
25.6	35.87	35.1	25.8	39.55	36.4	25.3	14.04	15.1	25.4	20.77	8.3	25.4	28.62	55.9
26.6	36.54	35.3	26.8	39.94	36.2	26.3	13.70	15.2	26.4	19.79	8.5	26.4	27.45	56.1
27.6	37.24	35.6	27.8	40.31	36.0	27.3	13.37	15.3	27.4	18.83	8.7	27.4	26.20	56.4
28.6	37.98	35.8	28.8	40.68	35.8	28.3	13.02	15.5	28.4	17.88	9.0	28.4	24.88	56.6
29.6	38.76	36.1	29.8	41.07	35.6	29.3	12.67	15.6	29.4	16.93	9.2	29.3	23.54	56.8
30.6	39.59	36.3	30.8	41.49	35.4	30.3	12.31	15.8	30.4	15.93	9.4	30.3	22.23	57.0
31.6	40.42	36.6	31.8	41.92	35.2	31.3	11.93	15.9	31.4	14.85	9.7	31.3	20.97	57.2
32.6	41.26	36.9	32.8	42.38	35.0	32.3	11.51	16.1	32.4	13.69	10.0	32.3	19.78	57.3

**CIRCUMPOLAR STARS.**

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

α Ursæ Min. (Polaris).			51 Cephei (Hæv.).			δ Ursæ Min.			ζ Ursæ Min.			σ Octantis.		
Mean Solar Date.	Right Ascen- sion.	Declina- tion North.	Mean Solar Date.	Right Ascen- sion.	Declina- tion North.	Mean Solar Date.	Right Ascen- sion.	Declina- tion North.	Mean Solar Date.	Right Ascen- sion.	Declina- tion North.	Mean Solar Date.	Right Ascen- sion.	Declina- tion South.
Sept.	h m	°	Sept.	h m	°	Sept.	h m	°	Sept.	h m	°	Sept.	h m	°
	1 25	+88 47		6 55	+87 11		18 2	+86 37		19 17	+89 0		19 7	-89 14
	s	"		s	"		s	"		s	"		s	"
1.6	41.26	36.9	1.8	42.38	35.0	1.3	71.51	16.1	1.4	73.69	10.0	1.3	79.78	57.3
2.6	42.07	37.3	2.8	42.87	34.8	2.3	71.08	16.2	2.4	72.46	10.2	2.3	78.66	57.5
3.6	42.82	37.6	3.8	43.37	34.6	3.3	70.64	16.3	3.4	71.15	10.4	3.3	77.57	57.7
4.6	43.51	38.0	4.8	43.88	34.4	4.3	70.20	16.4	4.4	69.82	10.6	4.3	76.52	57.9
5.6	44.12	38.3	5.8	44.37	34.3	5.3	69.76	16.5	5.3	68.48	10.8	5.3	75.45	58.1
6.6	44.68	38.6	6.8	44.86	34.2	6.3	69.33	16.5	6.3	67.15	11.0	6.3	74.32	58.3
7.6	45.20	38.9	7.8	45.34	34.0	7.3	68.91	16.6	7.3	65.87	11.2	7.3	73.08	58.5
8.6	45.72	39.3	8.8	45.79	33.9	8.3	68.52	16.6	8.3	64.62	11.3	8.3	71.75	58.7
9.6	46.25	39.6	9.8	46.23	33.8	9.3	68.13	16.7	9.3	63.44	11.5	9.3	70.31	58.9
10.6	46.82	39.9	10.8	46.67	33.7	10.3	67.75	16.7	10.3	62.28	11.6	10.3	68.83	59.1
11.6	47.42	40.2	11.8	47.11	33.5	11.3	67.38	16.8	11.3	61.13	11.8	11.3	67.29	59.3
12.6	48.07	40.5	12.8	47.56	33.4	12.3	66.98	16.9	12.3	59.94	12.0	12.3	65.75	59.4
13.6	48.74	40.8	13.8	48.03	33.2	13.3	66.58	17.0	13.3	58.73	12.2	13.3	64.23	59.5
14.6	49.44	41.1	14.8	48.52	33.0	14.3	66.15	17.0	14.3	57.46	12.4	14.3	62.78	59.6
15.6	50.11	41.4	15.8	49.05	32.9	15.3	65.71	17.1	15.3	56.14	12.6	15.3	61.37	59.7
16.6	50.73	41.8	16.8	49.58	32.7	16.3	65.25	17.2	16.3	54.73	12.8	16.3	60.05	59.8
17.6	51.29	42.2	17.8	50.11	32.6	17.3	64.79	17.2	17.3	53.28	12.9	17.3	58.74	59.9
18.6	51.77	42.6	18.8	50.66	32.5	18.3	64.33	17.2	18.3	51.81	13.1	18.3	57.44	60.0
19.6	52.18	43.0	19.8	51.18	32.4	19.3	63.89	17.2	19.3	50.36	13.2	19.3	56.09	60.2
20.6	52.55	43.3	20.8	51.70	32.4	20.3	63.45	17.2	20.3	48.94	13.3	20.3	54.67	60.3
21.5	52.88	43.7	21.8	52.18	32.3	21.3	63.04	17.2	21.3	47.56	13.4	21.3	53.15	60.5
22.5	53.20	44.0	22.8	52.66	32.2	22.2	62.64	17.2	22.3	46.26	13.5	22.3	51.54	60.6
23.5	53.56	44.3	23.8	53.11	32.2	23.2	62.25	17.1	23.3	45.00	13.6	23.3	49.85	60.7
24.5	53.94	44.6	24.8	53.57	32.1	24.2	61.87	17.1	24.3	43.78	13.7	24.3	48.09	60.8
25.5	54.36	45.0	25.8	54.03	32.0	25.2	61.49	17.1	25.3	42.54	13.8	25.3	46.31	60.9
26.5	54.84	45.3	26.8	54.49	31.9	26.2	61.10	17.2	26.3	41.29	13.9	26.3	44.55	61.0
27.5	55.33	45.6	27.8	54.99	31.8	27.2	60.70	17.2	27.3	39.98	14.1	27.3	42.85	61.0
28.5	55.82	46.0	28.8	55.51	31.7	28.2	60.27	17.2	28.3	38.60	14.2	28.3	41.24	61.0
29.5	56.30	46.4	29.8	56.05	31.6	29.2	59.82	17.2	29.3	37.16	14.3	29.3	39.70	61.1
30.5	56.71	46.7	30.8	56.62	31.5	30.2	59.35	17.2	30.3	35.64	14.5	30.3	38.24	61.1
31.5	57.06	47.1	31.7	57.21	31.5	31.2	58.89	17.2	31.3	34.08	14.6	31.3	36.80	61.1

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Ursæ Min. (Polaris).		Mean Solar Date.	51 Cephei (Hev.).		Mean Solar Date.	$\delta$ Ursæ Min.		Mean Solar Date.	$\lambda$ Ursæ Min.		Mean Solar Date.	$\sigma$ Octantis.	
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion South.
Oct.	h m	°	Oct.	h m	°	Oct.	h m	°	Oct.	h m	°	Oct.	h m	°
	1 25	+88 47		6 55	+87 11		18 2	+86 37		19 16	+89 0		19 6	-89 14
	s	"		s	"		s	"		s	"		s	"
1.5	57.06	47.1	1.7	57.21	31.5	1.2	58.89	17.2	1.3	94.08	14.6	1.3	96.80	61.1
2.5	57.34	47.5	2.7	57.77	31.5	2.2	58.43	17.1	2.3	92.50	14.6	2.3	95.39	61.2
3.5	57.55	47.9	3.7	58.33	31.5	3.2	57.97	17.0	3.3	90.96	14.7	3.3	93.96	61.2
4.5	57.72	48.3	4.7	58.86	31.5	4.2	57.54	16.9	4.3	89.44	14.7	4.3	92.45	61.3
5.5	57.86	48.7	5.7	59.38	31.5	5.2	57.12	16.8	5.3	87.97	14.8	5.2	90.86	61.4
6.5	58.01	49.1	6.7	59.88	31.4	6.2	56.72	16.7	6.3	86.58	14.8	6.2	89.20	61.4
7.5	58.17	49.4	7.7	60.37	31.4	7.2	56.34	16.7	7.3	85.22	14.8	7.2	87.47	61.4
8.5	58.37	49.8	8.7	60.84	31.4	8.2	55.95	16.6	8.3	83.89	14.9	8.2	85.69	61.5
9.5	58.62	50.1	9.7	61.33	31.4	9.2	55.55	16.5	9.3	82.57	14.9	9.2	83.90	61.4
10.5	58.89	50.5	10.7	61.84	31.4	10.2	55.15	16.5	10.3	81.21	15.0	10.2	82.15	61.4
11.5	59.19	50.8	11.7	62.35	31.3	11.2	54.74	16.4	11.3	79.81	15.1	11.2	80.47	61.4
12.5	59.47	51.2	12.7	62.89	31.3	12.2	54.31	16.4	12.3	78.34	15.1	12.2	78.87	61.3
13.5	59.71	51.6	13.7	63.45	31.3	13.2	53.87	16.3	13.2	76.82	15.2	13.2	77.35	61.3
14.5	59.90	52.0	14.7	64.03	31.3	14.2	53.42	16.2	14.2	75.26	15.3	14.2	75.88	61.2
15.5	60.00	52.4	15.7	64.59	31.3	15.2	52.97	16.1	15.2	73.67	15.3	15.2	74.45	61.2
16.5	60.03	52.8	16.7	65.14	31.3	16.2	52.53	16.0	16.2	72.09	15.3	16.2	73.00	61.1
17.5	60.01	53.2	17.7	65.68	31.4	17.2	52.12	15.8	17.2	70.55	15.3	17.2	71.52	61.1
18.5	59.94	53.6	18.7	66.21	31.5	18.2	51.72	15.7	18.2	69.06	15.3	18.2	69.96	61.1
19.5	59.86	54.0	19.7	66.71	31.5	19.2	51.35	15.5	19.2	67.63	15.2	19.2	68.33	61.0
20.5	59.78	54.3	20.7	67.17	31.6	20.2	50.99	15.4	20.2	66.28	15.2	20.2	66.62	61.0
21.5	59.73	54.7	21.7	67.62	31.6	21.2	50.64	15.2	21.2	64.97	15.1	21.2	64.85	60.9
22.5	59.72	55.0	22.7	68.07	31.7	22.2	50.30	15.1	22.2	63.69	15.1	22.2	63.06	60.9
23.5	59.75	55.4	23.7	68.54	31.7	23.2	49.95	15.0	23.2	62.40	15.1	23.2	61.29	60.8
24.5	59.80	55.7	24.7	69.03	31.7	24.2	49.59	14.8	24.2	61.08	15.1	24.2	59.58	60.6
25.5	59.86	56.1	25.7	69.54	31.8	25.2	49.22	14.7	25.2	59.71	15.1	25.2	57.97	60.5
26.5	59.92	56.5	26.7	70.07	31.8	26.2	48.81	14.6	26.2	58.27	15.1	26.2	56.46	60.3
27.5	59.91	56.9	27.7	70.61	31.8	27.2	48.40	14.5	27.2	56.77	15.1	27.2	55.03	60.2
28.4	59.85	57.3	28.7	71.18	31.9	28.1	47.99	14.3	28.2	55.23	15.0	28.2	53.68	60.1
29.4	59.72	57.7	29.7	71.73	32.0	29.1	47.58	14.1	29.2	53.64	15.0	29.2	52.37	59.9
30.4	59.52	58.1	30.7	72.27	32.1	30.1	47.18	13.9	30.2	52.10	14.9	30.2	51.07	59.8
31.4	59.28	58.5	31.7	72.80	32.3	31.1	46.78	13.7	31.2	50.59	14.8	31.2	49.74	59.7
32.4	58.98	58.9	32.7	73.30	32.4	32.1	46.42	13.5	32.2	49.13	14.7	32.2	48.35	59.6

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Ursæ Min. (Polaris).		Mean Solar Date.	$\gamma$ Cephei (Hév.).		Mean Solar Date.	$\delta$ Ursæ Min.		Mean Solar Date.	$\lambda$ Ursæ Min.		Mean Solar Date.	$\sigma$ Octantis.	
	Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion South.
	h m ° '	° '		h m ° '	° '		h m ° '	° '		h m ° '	° '		h m ° '	° '
Nov.	1 25	+88 47	Nov.	6 56	+87 11	Nov.	18 2	+86 37	Nov.	19 16	+89 0	Nov.	19 6	-89 14
	s	"		s	"		s	"		s	"		s	"
1.4	58.98	58.9	1.7	13.30	32.4	1.1	46.42	13.5	1.2	49.13	14.7	1.2	48.35	59.6
2.4	58.66	59.2	2.7	13.77	32.5	2.1	46.08	13.2	2.2	47.75	14.6	2.2	46.90	59.5
3.4	58.39	59.6	3.7	14.23	32.7	3.1	45.75	13.0	3.2	46.43	14.5	3.2	45.37	59.4
4.4	58.14	59.9	4.7	14.68	32.8	4.1	45.43	12.8	4.2	45.16	14.4	4.2	43.82	59.2
5.4	57.93	60.2	5.7	15.12	32.9	5.1	45.11	12.6	5.2	43.90	14.3	5.2	42.26	59.1
6.4	57.76	60.6	6.6	15.57	33.0	6.1	44.79	12.4	6.2	42.63	14.2	6.2	40.74	58.9
7.4	57.60	60.9	7.6	16.05	33.1	7.1	44.46	12.3	7.2	41.32	14.1	7.2	39.29	58.7
8.4	57.44	61.3	8.6	16.53	33.2	8.1	44.11	12.1	8.2	39.99	14.1	8.2	37.95	58.4
9.4	57.25	61.6	9.6	17.04	33.3	9.1	43.76	11.9	9.2	38.60	14.0	9.2	36.69	58.2
10.4	56.99	62.0	10.6	17.54	33.4	10.1	43.39	11.7	10.2	37.17	13.9	10.2	35.53	58.0
11.4	56.68	62.4	11.6	18.04	33.6	11.1	43.03	11.5	11.2	35.70	13.8	11.2	34.41	57.8
12.4	56.29	62.8	12.6	18.55	33.7	12.1	42.68	11.2	12.2	34.24	13.7	12.2	33.33	57.6
13.4	55.83	63.1	13.6	19.03	33.9	13.1	42.35	10.9	13.2	32.83	13.5	13.1	32.23	57.4
14.4	55.33	63.5	14.6	19.48	34.1	14.1	42.04	10.6	14.2	31.47	13.4	14.1	31.09	57.2
15.4	54.79	63.8	15.6	19.91	34.3	15.1	41.75	10.4	15.2	30.19	13.2	15.1	29.88	57.0
16.4	54.26	64.1	16.6	20.31	34.5	16.1	41.48	10.1	16.2	28.98	13.0	16.1	28.62	56.9
17.4	53.74	64.4	17.6	20.70	34.7	17.1	41.23	9.8	17.1	27.85	12.8	17.1	27.30	56.7
18.4	53.24	64.7	18.6	21.07	34.9	18.1	40.99	9.6	18.1	26.75	12.6	18.1	25.96	56.4
19.4	52.81	65.0	19.6	21.45	35.1	19.1	40.75	9.3	19.1	25.68	12.4	19.1	24.63	56.2
20.4	52.40	65.3	20.6	21.84	35.3	20.1	40.51	9.1	20.1	24.59	12.3	20.1	23.36	55.9
21.4	52.02	65.6	21.6	22.25	35.4	21.1	40.25	8.8	21.1	23.47	12.1	21.1	22.20	55.6
22.4	51.63	65.9	22.6	22.67	35.6	22.1	39.98	8.6	22.1	22.29	12.0	22.1	21.15	55.4
23.4	51.20	66.3	23.6	23.11	35.8	23.1	39.70	8.4	23.1	21.05	11.9	23.1	20.20	55.1
24.4	50.71	66.6	24.6	23.55	35.9	24.1	39.41	8.1	24.1	19.77	11.7	24.1	19.36	54.8
25.4	50.17	67.0	25.6	24.01	36.2	25.1	39.12	7.8	25.1	18.47	11.5	25.1	18.59	54.5
26.4	49.54	67.3	26.6	24.46	36.4	26.1	38.84	7.5	26.1	17.19	11.3	26.1	17.86	54.2
27.4	48.87	67.6	27.6	24.87	36.7	27.1	38.57	7.2	27.1	15.95	11.1	27.1	17.12	54.0
28.4	48.15	67.9	28.6	25.27	36.9	28.1	38.33	6.8	28.1	14.76	10.8	28.1	16.34	53.8
29.4	47.40	68.2	29.6	25.63	37.2	29.1	38.11	6.5	29.1	13.64	10.6	29.1	15.51	53.5
30.4	46.67	68.5	30.6	25.97	37.4	30.1	37.92	6.2	30.1	12.61	10.3	30.1	14.63	53.3
31.4	45.96	68.8	31.6	26.28	37.7	31.1	37.74	5.9	31.1	11.64	10.1	31.1	13.72	53.0

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

α Ursæ Min. (Polaris).			51 Cephei (HEV.).			δ Ursæ Min.			λ Ursæ Min.			σ Octantis.		
Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion South.
Dec.	h m 1 25	° +88 48	Dec.	h m 6 56	° +87 11	Dec.	h m 18 2	° +86 36	Dec.	h m 19 15	° +89 0	Dec.	h m 19 6	° -89 14
	s	"		s	"		s	"		s	"		s	"
1.4	45.96	8.8	1.6	26.28	37.7	1.1	37.74	65.9	1.1	71.64	10.1	1.1	13.72	53.0
2.4	45.31	9.0	2.6	26.59	37.9	2.1	37.56	65.6	2.1	70.71	9.9	2.1	12.80	52.7
3.3	44.68	9.3	3.6	26.91	38.1	3.1	37.39	65.3	3.1	69.79	9.6	3.1	11.93	52.4
4.3	44.08	9.5	4.6	27.24	38.3	4.0	37.21	65.0	4.1	68.87	9.4	4.1	11.12	52.1
5.3	43.50	9.8	5.6	27.57	38.6	5.0	37.02	64.7	5.1	67.90	9.2	5.1	10.41	51.8
6.3	42.91	10.1	6.6	27.92	38.8	6.0	36.82	64.4	6.1	66.90	9.0	6.1	9.81	51.4
7.3	42.28	10.3	7.6	28.29	39.0	7.0	36.61	64.1	7.1	65.86	8.8	7.1	9.32	51.1
8.3	41.58	10.6	8.6	28.66	39.3	8.0	36.40	63.8	8.1	64.79	8.6	8.1	8.90	50.8
9.3	40.82	10.9	9.6	29.01	39.5	9.0	36.20	63.5	9.1	63.73	8.4	9.1	8.53	50.5
10.3	39.97	11.2	10.6	29.35	39.8	10.0	36.02	63.2	10.1	62.71	8.1	10.1	8.18	50.2
11.3	39.07	11.5	11.6	29.65	40.1	11.0	35.85	62.8	11.1	61.74	7.8	11.1	7.80	49.9
12.3	38.13	11.7	12.5	29.92	40.5	12.0	35.71	62.4	12.1	60.86	7.5	12.1	7.36	49.6
13.3	37.19	11.9	13.5	30.17	40.8	13.0	35.61	62.1	13.1	60.06	7.2	13.1	6.88	49.3
14.3	36.26	12.1	14.5	30.39	41.1	14.0	35.52	61.7	14.1	59.35	6.9	14.1	6.33	49.0
15.3	35.37	12.3	15.5	30.59	41.4	15.0	35.45	61.4	15.1	58.68	6.6	15.1	5.78	48.7
16.3	34.53	12.4	16.5	30.80	41.6	16.0	35.39	61.0	16.1	58.06	6.3	16.1	5.23	48.4
17.3	33.72	12.6	17.5	31.00	41.9	17.0	35.32	60.7	17.1	57.44	6.0	17.0	4.73	48.0
18.3	32.96	12.8	18.5	31.21	42.2	18.0	35.24	60.4	18.1	56.82	5.8	18.0	4.32	47.7
19.3	32.19	13.0	19.5	31.45	42.4	19.0	35.15	60.1	19.1	56.14	5.5	19.0	4.03	47.3
20.3	31.42	13.2	20.5	31.69	42.7	20.0	35.04	59.8	20.1	55.42	5.3	20.0	3.86	46.9
21.3	30.60	13.4	21.5	31.93	42.9	21.0	34.93	59.5	21.1	54.67	5.0	21.0	3.81	46.6
22.3	29.73	13.6	22.5	32.19	43.2	22.0	34.83	59.2	22.1	53.89	4.7	22.0	3.84	46.2
23.3	28.79	13.8	23.5	32.44	43.6	22.9	34.73	58.8	23.0	53.11	4.4	23.0	3.93	45.9
24.3	27.78	14.0	24.5	32.66	43.9	23.9	34.64	58.4	24.0	52.37	4.1	24.0	4.02	45.6
25.3	26.74	14.2	25.5	32.87	44.3	24.9	34.57	58.0	25.0	51.70	3.8	25.0	4.11	45.3
26.3	25.67	14.4	26.5	33.04	44.6	25.9	34.53	57.7	26.0	51.09	3.4	26.0	4.14	45.0
27.3	24.61	14.5	27.5	33.18	44.9	26.9	34.50	57.3	27.0	50.57	3.1	27.0	4.14	44.7
28.3	23.59	14.7	28.5	33.31	45.3	27.9	34.50	56.9	28.0	50.14	2.7	28.0	4.10	44.4
29.3	22.59	14.8	29.5	33.42	45.6	28.9	34.52	56.6	29.0	49.76	2.4	29.0	4.04	44.1
30.3	21.64	14.9	30.5	33.51	45.9	29.9	34.54	56.2	30.0	49.41	2.1	30.0	4.00	43.7
31.3	20.75	15.0	31.5	33.61	46.2	30.9	34.55	55.9	31.0	49.07	1.8	31.0	4.03	43.4
32.3	19.88	15.1	32.5	33.72	46.5	31.9	34.56	55.6	32.0	48.70	1.5	32.0	4.15	43.0

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	43 Cephei (H.).		$\mu$ Hydri.		47 Cephei (H.).		$\delta$ Mensæ.		Groombridge 944.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.
	h m ° 55	° ' " +85 44	h m ° 33	° ' " -79 31	h m ° 53	° ' " +79 2	h m ° 24	° ' " -80 26	h m ° 31	° ' " +85 8
	s	"	s	"	s	"	s	"	s	"
Jan. 1.4	41.29	50.8	42.26	65.5	24.47	33.4	32.25	40.9	25.93	55.9
	2.85	0.4	1.16	0.9	0.82	1.8	1.00	2.4	0.48	3.1
11.3	38.44	51.2	41.10	66.4	23.65	35.2	31.25	43.3	25.45	59.0
	2.86	0.2	1.22	0.3	0.95	1.2	1.16	1.9	0.97	2.9
21.3	35.58	51.0	39.88	66.7	22.70	36.4	30.09	45.2	24.48	61.9
	2.76	1.0	1.24	0.3	1.02	0.6	1.29	1.4	1.43	2.5
31.3	32.82	50.0	38.64	66.4	21.68	37.0	28.80	46.6	23.05	64.4
	2.56	1.5	1.23	0.9	1.07	0.0	1.40	0.8	1.82	2.2
Feb. 10.2	30.26	48.5	37.41	65.5	20.61	37.0	27.40	47.4	21.23	66.6
	2.26	2.0	1.18	1.5	1.07	0.6	1.45	0.3	2.13	1.6
20.2	28.00	46.5	36.23	64.0	19.54	36.4	25.95	47.7	19.10	68.2
	1.86	2.5	1.12	1.9	1.02	1.2	1.47	0.3	2.36	1.0
Mar. 1.2	26.14	44.0	35.11	62.1	18.52	35.2	24.48	47.4	16.74	69.2
	1.40	2.8	1.01	2.4	0.93	1.7	1.45	0.8	2.48	0.5
11.2	24.74	41.2	34.10	59.7	17.59	33.5	23.03	46.6	14.26	69.7
	0.88	3.1	0.89	2.9	0.79	2.1	1.40	1.4	2.50	0.2
21.1	23.86	38.1	33.21	56.8	16.80	31.4	21.63	45.2	11.76	69.5
	0.33	3.1	0.73	3.1	0.63	2.5	1.30	1.8	2.41	0.7
31.1	23.53	35.0	32.48	53.7	16.17	28.9	20.33	43.4	9.35	68.8
	0.23	3.2	0.57	3.4	0.44	2.7	1.18	2.2	2.23	1.3
Apr. 10.1	23.76	31.8	31.91	50.3	15.73	26.2	19.15	41.2	7.12	67.5
	0.77	3.0	0.39	3.6	0.23	2.9	1.03	2.7	1.96	1.8
20.1	24.53	28.8	31.52	46.7	15.50	23.3	18.12	38.5	5.16	65.7
	1.28	2.7	0.20	3.7	0.01	2.9	0.86	2.9	1.63	2.2
30.0	25.81	26.1	31.32	43.0	15.49	20.4	17.26	35.6	3.53	63.5
	1.74	2.4	0.00	3.6	0.21	2.8	0.66	3.2	1.22	2.5
May 10.0	27.55	23.7	31.32	39.4	15.70	17.6	16.60	32.4	2.31	61.0
	2.14	2.0	0.20	3.7	0.41	2.7	0.45	3.4	0.80	2.8
20.0	29.69	21.7	31.52	35.7	16.11	14.9	16.15	29.0	1.51	58.2
	2.46	1.5	0.39	3.4	0.62	2.4	0.23	3.4	0.33	2.9
29.9	32.15	20.2	31.91	32.3	16.73	12.5	15.92	25.6	1.18	55.3
	2.70	1.0	0.57	3.3	0.79	2.1	0.01	3.5	0.13	3.0
June 8.9	34.85	19.2	32.48	29.0	17.52	10.4	15.91	22.1	1.31	52.3
	2.87	0.4	0.74	2.9	0.95	1.7	0.22	3.4	0.58	3.0
18.9	37.72	18.8	33.22	26.1	18.47	8.7	16.13	18.7	1.89	49.3
	2.96	0.1	0.90	2.5	1.06	1.2	0.43	3.2	1.03	2.8
28.9	40.68	18.9	34.12	23.6	19.53	7.5	16.56	15.5	2.92	46.5
	2.96	0.7	1.02	2.1	1.17	0.8	0.65	3.0	1.43	2.6
July 8.8	43.64	19.6	35.14	21.5	20.70	6.7	17.21	12.5	4.35	43.9
	2.90	1.2	1.11	1.6	1.24	0.3	0.82	2.7	1.81	2.4
18.8	46.54	20.8	36.25	19.9	21.94	6.4	18.03	9.8	6.16	41.5
	2.76	1.7	1.18	1.0	1.27	0.2	0.99	2.3	2.14	2.1
28.8	49.30	22.5	37.43	18.9	23.21	6.6	19.02	7.5	8.30	39.4
	2.57	2.2	1.20	0.4	1.29	0.7	1.13	1.8	2.42	1.7
Aug. 7.8	51.87	24.7	38.63	18.5	24.50	7.3	20.15	5.7	10.72	37.7
	2.31	2.6	1.20	0.1	1.27	1.1	1.23	1.2	2.65	1.4
17.7	54.18	27.3	39.83	18.6	25.77	8.4	21.38	4.5	13.37	36.3
	2.03	2.9	1.16	0.8	1.23	1.6	1.29	0.7	2.83	0.9
27.7	56.21	30.2	40.99	19.4	27.00	10.0	22.67	3.8	16.20	35.4
	1.68	3.3	1.07	1.3	1.16	2.0	1.31	0.1	2.95	0.4
Sept. 6.7	57.89	33.5	42.06	20.7	28.16	12.0	23.98	3.7	19.15	35.0
	1.31	3.5	0.95	2.0	1.08	2.4	1.29	0.6	3.01	0.0
16.6	59.20	37.0	43.01	22.7	29.24	14.4	25.27	4.3	22.16	35.0
	0.91	3.7	0.80	2.3	0.97	2.7	1.23	1.2	3.02	0.4
26.6	60.11	40.7	43.81	25.0	30.21	17.1	26.50	5.5	25.18	35.4
	0.48	3.7	0.62	2.8	0.84	2.9	1.12	1.8	2.96	0.9
Oct. 6.6	60.59	44.4	44.43	27.8	31.05	20.0	27.62	7.3	28.14	36.3
	0.05	3.8	0.41	3.1	0.70	3.2	0.97	2.2	2.85	1.3
16.6	60.64	48.2	44.84	30.9	31.75	23.2	28.59	9.5	30.99	37.6
	0.40	3.7	0.20	3.2	0.55	3.4	0.79	2.7	2.66	1.8
26.5	60.24	51.9	45.04	34.1	32.30	26.6	29.38	12.2	33.65	39.4
	0.85	3.5	0.02	3.3	0.37	3.4	0.57	3.1	2.42	2.2
Nov. 5.5	59.39	55.4	45.02	37.4	32.67	30.0	29.95	15.3	36.07	41.6
	1.29	3.3	0.25	3.3	0.18	3.4	0.34	3.3	2.11	2.5
15.5	58.10	58.7	44.77	40.7	32.85	33.4	30.29	18.6	38.18	44.1
	1.70	2.9	0.46	3.0	0.00	3.3	0.08	3.4	1.74	2.8
25.5	56.40	61.6	44.31	43.7	32.85	36.7	30.37	22.0	39.92	46.9
	2.07	2.5	0.66	2.7	0.20	3.1	0.16	3.3	1.32	3.1
Dec. 5.4	54.33	64.1	43.65	46.4	32.65	39.8	30.21	25.3	41.24	50.0
	2.40	2.0	0.83	2.3	0.39	2.9	0.42	3.2	0.86	3.2
15.3	51.93	66.1	42.82	48.7	32.26	42.7	29.79	28.5	42.10	53.2
	2.65	1.4	0.98	1.8	0.57	2.5	0.65	3.0	0.35	3.3
25.3	49.28	67.5	41.84	50.5	31.69	45.2	29.14	31.5	42.45	56.5
	2.82	0.8	1.09	1.3	0.74	2.1	0.88	2.7	0.15	3.2
35.3	46.46	68.3	40.75	51.8	30.95	47.3	28.26	34.2	42.30	59.7



# FIXED STARS, 1904.

(CONSTANTS OF PARIS CONFERENCE.)

549

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Mensæ.		25 Camelop. (H.)		ι Draconis (H.)		ζ Chamæleontis.		δ <sup>2</sup> Chamæleontis.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.
	h m 6 47	° ' " -80 42	h m 7 10	° ' " +82 35	h m 9 23	° ' " +81 44	h m 9 36	° ' " -80 30	h m 10 44	° ' " -80 1
	s "	"	s "	"	s "	"	s "	"	s "	"
Jan. 1.6	71.85 <sub>0.28</sub>	54.7 <sub>3.5</sub>	64.45 <sub>0.45</sub>	39.1 <sub>3.0</sub>	30.68 <sub>1.19</sub>	44.6 <sub>2.1</sub>	52.67 <sub>0.73</sub>	28.1 <sub>3.3</sub>	60.53 <sub>1.03</sub>	48.0 <sub>2.7</sub>
11.6	71.57 <sub>0.54</sub>	58.2 <sub>3.4</sub>	64.90 <sub>0.11</sub>	42.1 <sub>3.1</sub>	31.87 <sub>0.94</sub>	46.7 <sub>2.5</sub>	53.40 <sub>0.52</sub>	31.4 <sub>3.6</sub>	61.56 <sub>0.86</sub>	50.7 <sub>3.2</sub>
21.5	71.03 <sub>0.77</sub>	61.6 <sub>3.2</sub>	65.01 <sub>0.23</sub>	45.2 <sub>3.0</sub>	32.81 <sub>0.66</sub>	49.2 <sub>2.9</sub>	53.92 <sub>0.27</sub>	35.0 <sub>3.8</sub>	62.42 <sub>0.66</sub>	53.9 <sub>3.5</sub>
31.5	70.26 <sub>0.98</sub>	64.8 <sub>2.8</sub>	64.78 <sub>0.57</sub>	48.2 <sub>2.9</sub>	33.47 <sub>0.35</sub>	52.1 <sub>3.0</sub>	54.19 <sub>0.04</sub>	38.8 <sub>3.8</sub>	63.08 <sub>0.46</sub>	57.4 <sub>3.7</sub>
Feb. 10.5	69.28 <sub>1.17</sub>	67.6 <sub>2.4</sub>	64.21 <sub>0.88</sub>	51.1 <sub>2.6</sub>	33.82 <sub>0.04</sub>	55.1 <sub>3.1</sub>	54.23 <sub>0.19</sub>	42.6 <sub>3.8</sub>	63.54 <sub>0.25</sub>	61.1 <sub>3.9</sub>
20.5	68.11 <sub>1.31</sub>	70.0 <sub>2.0</sub>	63.33 <sub>1.14</sub>	53.7 <sub>2.2</sub>	33.86 <sub>0.27</sub>	58.2 <sub>3.1</sub>	54.04 <sub>0.42</sub>	46.4 <sub>3.7</sub>	63.79 <sub>0.04</sub>	65.0 <sub>3.8</sub>
Mar. 1.4	66.80 <sub>1.42</sub>	72.0 <sub>1.5</sub>	62.19 <sub>1.35</sub>	55.9 <sub>1.7</sub>	33.59 <sub>0.55</sub>	61.3 <sub>2.9</sub>	53.62 <sub>0.62</sub>	50.1 <sub>3.5</sub>	63.83 <sub>0.17</sub>	68.8 <sub>3.8</sub>
11.4	65.38 <sub>1.48</sub>	73.5 <sub>1.0</sub>	60.84 <sub>1.50</sub>	57.6 <sub>1.2</sub>	33.04 <sub>0.80</sub>	64.2 <sub>2.6</sub>	53.00 <sub>0.80</sub>	53.6 <sub>3.2</sub>	63.66 <sub>0.36</sub>	72.6 <sub>3.7</sub>
21.4	63.90 <sub>1.52</sub>	74.5 <sub>0.5</sub>	59.34 <sub>1.58</sub>	58.8 <sub>0.6</sub>	32.24 <sub>1.03</sub>	66.8 <sub>2.2</sub>	52.20 <sub>0.95</sub>	56.8 <sub>2.9</sub>	63.30 <sub>0.54</sub>	76.3 <sub>3.5</sub>
31.3	62.38 <sub>1.51</sub>	75.0 <sub>0.1</sub>	57.76 <sub>1.60</sub>	59.4 <sub>0.1</sub>	31.21 <sub>1.18</sub>	69.0 <sub>1.8</sub>	51.25 <sub>1.08</sub>	59.7 <sub>2.4</sub>	62.76 <sub>0.69</sub>	79.8 <sub>3.1</sub>
Apr. 10.3	60.87 <sub>1.47</sub>	74.9 <sub>0.5</sub>	56.16 <sub>1.55</sub>	59.5 <sub>0.5</sub>	30.03 <sub>1.30</sub>	70.8 <sub>1.2</sub>	50.17 <sub>1.19</sub>	62.1 <sub>2.0</sub>	62.07 <sub>0.83</sub>	82.9 <sub>2.8</sub>
20.3	59.40 <sub>1.39</sub>	74.4 <sub>1.1</sub>	54.61 <sub>1.43</sub>	59.0 <sub>1.1</sub>	28.73 <sub>1.36</sub>	72.0 <sub>0.7</sub>	48.98 <sub>1.25</sub>	64.1 <sub>1.5</sub>	61.24 <sub>0.95</sub>	85.7 <sub>2.4</sub>
30.3	58.01 <sub>1.28</sub>	73.3 <sub>1.6</sub>	53.18 <sub>1.28</sub>	57.9 <sub>1.6</sub>	27.37 <sub>1.37</sub>	72.7 <sub>0.2</sub>	47.73 <sub>1.29</sub>	65.6 <sub>1.0</sub>	60.29 <sub>1.04</sub>	88.1 <sub>1.9</sub>
May 10.2	56.73 <sub>1.14</sub>	71.7 <sub>1.9</sub>	51.90 <sub>1.07</sub>	56.3 <sub>2.0</sub>	26.00 <sub>1.33</sub>	72.9 <sub>0.5</sub>	46.44 <sub>1.31</sub>	66.6 <sub>0.1</sub>	59.25 <sub>1.11</sub>	90.0 <sub>1.4</sub>
20.2	55.59 <sub>0.97</sub>	69.8 <sub>2.4</sub>	50.83 <sub>0.83</sub>	54.3 <sub>2.3</sub>	24.67 <sub>1.25</sub>	72.4 <sub>1.0</sub>	45.13 <sub>1.28</sub>	67.1 <sub>0.5</sub>	58.14 <sub>1.15</sub>	91.4 <sub>0.8</sub>
30.2	54.62 <sub>0.79</sub>	67.4 <sub>2.7</sub>	50.00 <sub>0.56</sub>	52.0 <sub>2.7</sub>	23.42 <sub>1.12</sub>	71.4 <sub>1.4</sub>	43.85 <sub>1.23</sub>	67.0 <sub>0.6</sub>	56.99 <sub>1.16</sub>	92.2 <sub>0.3</sub>
June 9.2	53.83 <sub>0.58</sub>	64.7 <sub>2.9</sub>	49.44 <sub>0.28</sub>	49.3 <sub>2.8</sub>	22.30 <sub>0.96</sub>	70.0 <sub>2.0</sub>	42.62 <sub>1.15</sub>	66.4 <sub>1.2</sub>	55.83 <sub>1.15</sub>	92.5 <sub>0.2</sub>
19.1	53.25 <sub>0.36</sub>	61.8 <sub>3.2</sub>	49.16 <sub>0.00</sub>	46.5 <sub>3.0</sub>	21.34 <sub>0.78</sub>	68.0 <sub>2.3</sub>	41.47 <sub>1.05</sub>	65.2 <sub>1.7</sub>	54.68 <sub>1.11</sub>	92.3 <sub>0.8</sub>
29.1	52.89 <sub>0.13</sub>	58.6 <sub>3.3</sub>	49.16 <sub>0.29</sub>	43.5 <sub>3.0</sub>	20.56 <sub>0.58</sub>	65.7 <sub>2.7</sub>	40.42 <sub>0.90</sub>	63.5 <sub>2.1</sub>	53.57 <sub>1.03</sub>	91.5 <sub>1.3</sub>
July 9.1	52.76 <sub>0.10</sub>	55.3 <sub>3.2</sub>	49.45 <sub>0.57</sub>	40.5 <sub>3.0</sub>	19.98 <sub>0.36</sub>	63.0 <sub>3.0</sub>	39.52 <sub>0.71</sub>	61.4 <sub>2.5</sub>	52.54 <sub>0.93</sub>	90.2 <sub>1.8</sub>
19.0	52.86 <sub>0.33</sub>	52.1 <sub>3.2</sub>	50.02 <sub>0.83</sub>	37.5 <sub>2.9</sub>	19.62 <sub>0.13</sub>	60.0 <sub>3.2</sub>	38.78 <sub>0.55</sub>	58.9 <sub>2.8</sub>	51.61 <sub>0.79</sub>	88.4 <sub>2.2</sub>
29.0	53.19 <sub>0.56</sub>	48.9 <sub>3.0</sub>	50.85 <sub>1.08</sub>	34.6 <sub>2.8</sub>	19.49 <sub>0.09</sub>	56.8 <sub>3.3</sub>	38.23 <sub>0.35</sub>	56.1 <sub>3.0</sub>	50.82 <sub>0.64</sub>	86.2 <sub>2.6</sub>
Aug. 8.0	53.75 <sub>0.76</sub>	45.9 <sub>2.7</sub>	51.93 <sub>1.30</sub>	31.8 <sub>2.5</sub>	19.58 <sub>0.32</sub>	53.5 <sub>3.4</sub>	37.88 <sub>0.13</sub>	53.1 <sub>3.1</sub>	50.18 <sub>0.46</sub>	83.6 <sub>2.9</sub>
18.0	54.51 <sub>0.96</sub>	43.2 <sub>2.3</sub>	53.23 <sub>1.50</sub>	29.3 <sub>2.3</sub>	19.50 <sub>0.55</sub>	50.1 <sub>3.3</sub>	37.75 <sub>0.11</sub>	50.0 <sub>3.2</sub>	49.72 <sub>0.25</sub>	80.7 <sub>3.1</sub>
27.9	55.47 <sub>1.11</sub>	40.9 <sub>1.9</sub>	54.73 <sub>1.66</sub>	27.0 <sub>1.9</sub>	20.45 <sub>0.76</sub>	46.8 <sub>3.3</sub>	37.86 <sub>0.33</sub>	46.8 <sub>3.1</sub>	49.47 <sub>0.03</sub>	77.6 <sub>3.2</sub>
Sept. 6.9	56.58 <sub>1.24</sub>	39.0 <sub>1.3</sub>	56.39 <sub>1.81</sub>	25.1 <sub>1.6</sub>	21.21 <sub>0.96</sub>	43.5 <sub>3.2</sub>	38.19 <sub>0.56</sub>	43.7 <sub>2.9</sub>	49.44 <sub>0.19</sub>	74.4 <sub>3.1</sub>
16.9	57.82 <sub>1.32</sub>	37.7 <sub>0.8</sub>	58.20 <sub>1.91</sub>	23.5 <sub>1.1</sub>	22.17 <sub>1.15</sub>	40.3 <sub>2.9</sub>	38.75 <sub>0.78</sub>	40.8 <sub>2.6</sub>	49.63 <sub>0.41</sub>	71.3 <sub>3.0</sub>
26.9	59.14 <sub>1.37</sub>	36.9 <sub>0.1</sub>	60.11 <sub>1.98</sub>	22.4 <sub>0.8</sub>	23.32 <sub>1.32</sub>	37.4 <sub>2.6</sub>	39.53 <sub>0.97</sub>	38.2 <sub>2.1</sub>	50.04 <sub>0.64</sub>	68.3 <sub>2.7</sub>
Oct. 6.8	60.51 <sub>1.36</sub>	36.8 <sub>0.6</sub>	62.09 <sub>2.02</sub>	21.6 <sub>0.2</sub>	24.64 <sub>1.45</sub>	34.8 <sub>2.4</sub>	40.50 <sub>1.13</sub>	36.1 <sub>1.7</sub>	50.68 <sub>0.84</sub>	65.6 <sub>2.3</sub>
16.8	61.87 <sub>1.31</sub>	37.4 <sub>1.2</sub>	64.11 <sub>2.01</sub>	21.3 <sub>0.2</sub>	26.12 <sub>1.59</sub>	32.4 <sub>1.9</sub>	41.63 <sub>1.26</sub>	34.4 <sub>1.1</sub>	51.52 <sub>1.02</sub>	63.3 <sub>1.9</sub>
26.8	63.18 <sub>1.20</sub>	38.6 <sub>1.8</sub>	66.12 <sub>1.96</sub>	21.5 <sub>0.7</sub>	27.71 <sub>1.69</sub>	30.5 <sub>1.4</sub>	42.89 <sub>1.35</sub>	33.3 <sub>0.4</sub>	52.54 <sub>1.16</sub>	61.4 <sub>1.3</sub>
Nov. 5.7	64.38 <sub>1.06</sub>	40.4 <sub>2.3</sub>	68.08 <sub>1.86</sub>	22.2 <sub>1.1</sub>	29.40 <sub>1.75</sub>	29.1 <sub>0.9</sub>	44.24 <sub>1.38</sub>	32.9 <sub>0.2</sub>	53.70 <sub>1.27</sub>	60.1 <sub>0.7</sub>
15.7	65.44 <sub>0.87</sub>	42.7 <sub>2.8</sub>	69.94 <sub>1.71</sub>	23.3 <sub>1.7</sub>	31.15 <sub>1.76</sub>	28.2 <sub>0.4</sub>	45.62 <sub>1.37</sub>	33.1 <sub>0.9</sub>	54.97 <sub>1.33</sub>	59.4 <sub>0.0</sub>
25.7	66.31 <sub>0.65</sub>	45.5 <sub>3.2</sub>	71.65 <sub>1.51</sub>	25.0 <sub>2.0</sub>	32.91 <sub>1.73</sub>	27.8 <sub>0.2</sub>	46.99 <sub>1.30</sub>	34.0 <sub>1.5</sub>	56.30 <sub>1.34</sub>	59.4 <sub>0.6</sub>
Dec. 5.7	66.96 <sub>0.41</sub>	48.7 <sub>3.4</sub>	73.16 <sub>1.23</sub>	27.0 <sub>2.4</sub>	34.64 <sub>1.66</sub>	28.0 <sub>0.7</sub>	48.29 <sub>1.20</sub>	35.5 <sub>2.2</sub>	57.64 <sub>1.31</sub>	60.0 <sub>1.3</sub>
15.6	67.37 <sub>0.14</sub>	52.1 <sub>3.5</sub>	74.44 <sub>0.99</sub>	29.4 <sub>2.8</sub>	36.30 <sub>1.52</sub>	28.7 <sub>1.3</sub>	49.49 <sub>1.04</sub>	37.7 <sub>2.6</sub>	58.95 <sub>1.24</sub>	61.3 <sub>1.9</sub>
25.6	67.51 <sub>0.12</sub>	55.6 <sub>3.6</sub>	75.43 <sub>0.68</sub>	32.2 <sub>3.0</sub>	37.82 <sub>1.34</sub>	30.0 <sub>1.9</sub>	50.53 <sub>0.86</sub>	40.3 <sub>3.1</sub>	60.19 <sub>1.11</sub>	63.2 <sub>2.4</sub>
35.6	67.39	59.2	76.11	35.2	39.16	31.9	51.39	43.4	61.30	65.6

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\gamma$ Octantis.		$\beta$ Chamæleontis.		6 Ursæ Min. (B.)		32 <sup>d</sup> Camelop. (H.)		$\kappa$ Octantis.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.
	h m 10 59	° ' " -84 4	h m 12 12	° ' " -78 46	h m 12 13	° ' " +88 13	h m 12 48	° ' " +83 55	h m 13 25	° ' " -85 17
Jan. 1.7	71.31 s	23.5 "	46.29 s	25.3 "	67.7 s	35.3 "	18.30 s	46.2 "	21.82 s	16.6 "
11.7	73.07 1.76	26.0 2.5	47.48 1.19	27.0 1.7	75.0 7.3	35.4 0.1	20.48 2.18	45.7 0.5	24.74 2.92	17.1 0.5
21.7	74.57 1.50	29.0 3.0	48.58 1.10	29.2 2.2	82.0 7.0	36.1 0.7	22.64 2.16	45.9 0.2	27.63 2.89	18.2 1.1
31.7	75.77 1.20	32.3 3.3	49.57 0.99	32.0 2.8	88.4 6.4	37.5 1.4	24.70 2.06	46.7 0.8	30.38 2.75	19.9 1.7
Feb. 10.6	76.64 0.87	35.9 3.6	50.43 0.86	35.1 3.1	94.1 5.7	39.4 1.9	26.58 1.88	48.2 1.5	32.95 2.57	22.2 2.2
20.6	77.17 0.53	39.7 3.8	51.12 0.69	38.5 3.4	98.9 4.8	41.8 2.4	28.22 1.64	50.1 1.9	35.27 2.32	24.7 2.6
Mar. 1.6	77.36 0.19	43.6 3.9	51.65 0.53	42.1 3.6	102.5 3.6	44.6 2.8	29.57 1.35	52.6 2.5	37.30 2.03	27.7 3.0
11.5	77.20 0.16	47.4 3.8	52.00 0.35	45.8 3.7	104.9 2.4	47.6 3.0	30.57 1.00	55.4 2.8	38.98 1.68	31.0 3.3
21.5	76.73 0.47	51.2 3.8	52.19 0.19	49.6 3.8	105.9 1.0	50.8 3.2	31.19 0.62	58.5 3.1	40.30 1.32	34.5 3.5
31.5	75.94 0.79	54.8 3.6	52.20 0.01	53.3 3.7	105.6 0.3	54.0 3.2	31.43 0.24	61.7 3.2	41.24 0.94	38.2 3.7
Apr. 10.5	74.89 1.05	58.1 3.3	52.06 0.14	56.9 3.6	104.0 1.6	57.1 3.1	31.28 0.15	64.8 3.1	41.79 0.55	41.9 3.7
20.4	73.58 1.31	61.1 3.0	51.75 0.31	60.3 3.4	101.1 2.9	60.0 2.9	30.76 0.52	67.9 3.1	41.94 0.15	45.5 3.6
30.4	72.05 1.53	63.7 2.6	51.30 0.45	63.4 3.1	97.2 3.9	62.5 2.5	29.91 0.85	70.7 2.8	41.70 0.24	49.1 3.6
May 10.4	70.35 1.70	65.9 2.2	50.72 0.58	66.2 2.8	92.3 4.9	64.7 2.2	28.75 1.16	73.2 2.5	41.06 0.64	52.5 3.4
20.4	68.51 1.84	67.6 1.7	50.03 0.69	68.6 2.4	86.7 5.6	66.3 1.6	27.33 1.42	75.3 2.1	40.06 1.00	55.6 3.1
30.3	66.57 1.99	68.7 1.1	49.23 0.80	70.6 2.0	80.5 6.2	67.4 1.1	25.72 1.61	77.0 1.7	38.72 1.34	58.4 2.8
June 9.3	64.58 1.99	69.3 0.6	48.36 0.87	72.0 1.4	74.0 6.5	68.0 0.6	23.95 1.77	78.0 1.0	37.06 1.66	60.8 2.4
19.3	62.58 2.00	69.4 0.1	47.42 0.94	72.9 0.9	67.3 6.7	68.0 0.0	22.09 1.86	78.6 0.6	35.13 1.93	62.7 1.9
29.2	60.64 1.94	68.9 0.5	46.45 0.97	73.3 0.4	60.6 6.7	68.0 0.6	20.18 1.91	78.6 0.0	32.98 2.15	64.2 1.5
July 9.2	58.80 1.84	67.8 1.1	45.48 0.97	73.1 0.2	54.2 6.4	66.3 1.1	18.27 1.91	78.0 0.6	30.67 2.31	65.1 0.9
19.2	57.12 1.68	66.3 1.5	44.52 0.96	72.4 0.7	48.1 6.1	64.6 1.7	16.42 1.85	76.9 1.1	28.26 2.41	65.4 0.3
29.2	55.64 1.48	64.2 2.1	43.61 0.91	71.1 1.3	42.5 5.6	62.5 2.1	14.66 1.76	75.3 1.6	25.83 2.43	65.2 0.2
Aug. 8.1	54.41 1.23	61.8 2.4	42.78 0.83	69.4 1.7	37.5 5.0	60.0 2.5	13.04 1.62	73.2 2.1	23.46 2.37	64.5 0.7
18.1	53.48 0.93	59.0 2.8	42.06 0.72	67.2 2.2	33.3 4.2	57.0 3.0	11.59 1.45	70.6 2.6	21.22 2.24	63.1 1.4
28.1	52.89 0.59	56.0 3.0	41.48 0.58	64.6 2.6	29.9 3.4	53.7 3.3	10.34 1.25	67.7 2.9	19.20 2.02	61.3 1.8
Sept. 7.1	52.66 0.23	52.9 3.1	41.06 0.42	61.8 2.8	27.4 2.5	50.2 3.5	9.33 1.01	64.5 3.2	17.47 1.73	59.0 2.3
17.0	52.81 0.15	49.8 3.1	40.83 0.23	58.7 3.1	26.0 1.4	46.6 3.6	8.59 0.74	61.0 3.5	16.11 1.36	56.4 2.6
27.0	53.35 0.54	46.7 3.1	40.79 0.04	55.6 3.1	25.5 0.5	42.8 3.8	8.13 0.46	57.3 3.7	15.17 0.94	53.5 2.9
Oct. 7.0	54.26 0.91	43.8 2.9	40.97 0.18	52.6 3.0	26.0 0.5	39.0 3.4	7.97 0.16	53.5 3.8	14.71 0.46	50.4 3.1
16.9	55.53 1.27	41.3 2.5	41.36 0.39	49.7 2.9	27.7 1.7	35.2 3.8	8.12 0.15	49.7 3.8	14.75 0.04	47.2 3.2
26.9	57.10 1.57	39.2 2.1	41.95 0.59	47.1 2.6	30.3 2.6	31.6 3.6	8.60 0.48	45.9 3.8	15.30 0.55	44.2 3.0
Nov. 5.9	58.94 1.84	37.7 1.5	42.73 0.78	44.8 2.3	34.0 3.7	28.3 3.3	9.40 0.80	42.3 3.6	16.36 1.06	41.3 2.9
15.9	60.97 2.03	36.7 1.0	43.67 1.08	43.1 1.7	38.7 4.7	25.2 3.1	10.53 1.13	38.9 3.4	17.89 1.53	38.7 2.6
25.8	63.12 2.15	36.3 0.4	44.75 1.08	42.0 1.1	44.2 5.5	22.6 2.6	11.94 1.41	35.8 3.1	19.85 1.96	36.5 2.2
Dec. 5.8	65.33 2.21	36.7 0.4	45.92 1.17	41.4 0.6	50.4 6.2	20.4 2.2	13.62 1.68	33.2 2.6	22.16 2.31	34.9 1.6
15.8	67.50 2.17	37.6 0.9	47.15 1.23	41.5 0.1	57.2 6.8	18.9 1.5	15.53 1.91	31.0 2.2	24.75 2.59	33.8 1.1
25.8	69.56 2.06	39.2 1.6	48.40 1.25	42.2 0.7	64.4 7.2	17.9 1.0	17.60 2.07	29.5 1.5	27.54 2.79	33.3 0.5
35.7	71.44 1.88	41.4 2.2	49.62 1.22	43.6 1.4	71.7 7.3	17.6 0.3	19.76 2.16	28.6 0.9	30.43 2.89	33.4 0.1

# FIXED STARS, 1904.

551

(CONSTANTS OF PARIS CONFERENCE.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\delta$ Octantis.		$\alpha$ Apodis.		$\rho$ Octantis.		$\gamma$ Apodis.		$\epsilon$ Ursæ Minoris.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.
	h m 14 11	° ' " -83 13	h m 14 35	° ' " -78 37	h m 15 20	° ' " -84 8	h m 16 18	° ' " -78 40	h m 16 55	° ' " +82 11
Jan. 1.9	28.53 s	19.1 "	53.72 s	52.1 "	59.78 s	23.5 "	38.42 s	36.0 "	36.56 s	45.8 "
11.9	30.60 2.07	19.0 0.1	54.98 1.26	51.8 0.3	62.00 2.22	22.3 1.2	39.47 1.05	34.2 1.8	37.27 0.71	42.6 3.2
21.9	32.71 2.11	19.4 0.4	56.28 1.30	51.9 0.1	64.38 2.38	21.7 0.6	40.64 1.17	32.9 1.3	38.26 0.99	39.7 2.9
31.8	34.80 2.09	20.5 1.1	57.59 1.31	52.7 0.8	66.85 2.47	21.6 0.1	41.91 1.27	32.0 0.9	39.49 1.23	37.2 2.5
Feb. 10.8	36.81 2.01	22.1 1.6	58.87 1.28	54.0 1.3	69.35 2.50	22.1 0.5	43.23 1.32	31.7 0.3	40.90 1.41	35.3 1.9
	1.89	2.0	1.22	1.7	2.47	1.0	1.35	0.1	1.56	1.3
20.8	38.70	24.1	60.09	55.7	71.82	23.1	44.58	31.8	42.46	34.0
Mar. 1.8	40.43 1.73	26.6 2.5	61.23 1.14	57.9 2.2	74.20 2.38	24.5 1.4	45.92 1.34	32.4 0.6	44.09 1.63	33.3 0.7
11.7	41.97 1.54	29.4 2.8	62.27 1.04	60.4 2.5	76.43 2.23	26.5 2.0	47.23 1.31	33.5 1.1	45.73 1.64	33.3 0.0
21.7	43.28 1.31	32.5 3.1	63.18 0.91	63.3 2.9	78.49 2.06	28.8 2.3	48.48 1.25	35.0 1.5	47.33 1.60	34.0 0.7
31.7	44.35 1.07	35.9 3.4	63.96 0.78	66.3 3.0	80.33 1.84	31.4 2.6	49.65 1.17	36.8 1.8	48.82 1.49	35.3 1.3
	0.81	3.4	0.62	3.3	1.58	2.9	1.07	2.2	1.35	1.8
Apr. 10.6	45.16	39.3	64.58	69.6	81.91	34.3	50.72	39.0	50.17	37.1
20.6	45.70 0.54	42.9 3.6	65.06 0.48	72.9 3.3	83.21 1.30	37.5 3.2	51.67 0.95	41.5 2.5	51.32 1.15	39.4 2.3
30.6	45.96 0.26	46.4 3.5	65.37 0.31	76.2 3.3	84.20 0.99	40.7 3.2	52.48 0.81	44.2 2.7	52.24 0.92	42.1 2.7
May 10.6	45.94 0.02	49.8 3.4	65.51 0.14	79.5 3.3	84.88 0.68	44.0 3.3	53.14 0.66	47.0 2.8	52.90 0.66	45.0 2.9
20.5	45.65 0.29	53.1 3.0	65.49 0.02	82.7 3.2	85.22 0.34	47.4 3.4	53.63 0.49	50.0 3.0	53.29 0.39	48.2 3.2
	0.57	3.0	0.19	3.0	0.01	3.2	0.32	3.0	0.11	3.2
30.5	45.08	56.1	65.30	85.7	85.21	50.6	53.95	53.0	53.40	51.4
June 9.5	44.27 0.81	58.8 2.7	64.96 0.34	88.5 2.8	84.87 0.34	53.7 3.1	54.09 0.14	56.0 3.0	53.23 0.17	54.6 3.2
19.5	43.22 1.05	61.2 2.4	64.46 0.50	91.0 2.5	84.19 0.68	56.6 2.9	54.05 0.04	58.9 2.9	52.78 0.45	57.7 3.1
29.4	41.96 1.26	63.1 1.9	63.83 0.63	92.9 1.9	83.21 0.98	59.1 2.5	53.82 0.23	61.6 2.7	52.08 0.70	60.6 2.9
July 9.4	40.53 1.43	64.5 0.9	63.07 0.76	94.5 1.6	81.94 1.27	61.3 2.2	53.43 0.39	64.1 2.1	51.13 0.95	63.2 2.6
	1.56	0.9	0.85	1.1	1.52	1.7	0.57	2.1	1.16	2.3
19.4	38.97	65.4	62.22	95.6	80.42	63.0	52.86	66.2	49.97	65.5
29.3	37.33 1.64	65.8 0.4	61.29 0.93	96.2 0.6	78.70 1.72	64.3 1.3	52.15 0.71	68.0 1.8	48.62 1.35	67.3 1.8
Aug. 8.3	35.66 1.67	65.6 0.2	60.33 0.96	96.2 0.0	76.84 1.86	65.0 0.7	51.32 0.83	69.3 1.3	47.11 1.51	68.8 1.5
18.3	34.02 1.64	64.8 0.8	59.35 0.98	95.7 0.5	74.89 1.95	65.2 0.2	50.39 0.93	70.2 0.9	45.48 1.63	69.7 0.9
28.3	32.46 1.56	63.5 1.3	58.41 0.94	94.7 1.0	72.93 1.96	64.8 0.4	49.40 0.99	70.5 0.3	43.76 1.72	70.2 0.5
	1.42	1.8	0.89	1.4	1.91	0.9	1.01	0.2	1.77	0.0
Sept. 7.2	31.04	61.7	57.52	93.3	71.02	63.9	48.39	70.3	41.99	70.2
17.2	29.83 1.21	59.5 2.2	56.74 0.78	91.2 2.1	69.24 1.78	62.4 1.5	47.39 1.00	69.5 0.8	40.21 1.78	69.7 0.5
27.2	28.87 0.96	56.9 2.6	56.10 0.64	88.8 2.4	67.67 1.57	60.4 2.0	46.46 0.93	68.2 1.3	38.46 1.75	68.6 1.1
Oct. 7.2	28.22 0.65	54.0 2.9	55.62 0.48	86.1 2.7	66.37 1.30	58.0 2.4	45.62 0.84	66.5 1.7	36.80 1.66	67.1 1.5
17.1	27.90 0.32	50.9 3.1	55.34 0.28	83.2 2.9	65.41 0.96	55.3 2.7	44.92 0.70	64.3 2.2	35.24 1.56	65.1 2.0
	0.04	3.1	0.07	2.9	0.59	3.0	0.52	2.5	1.39	2.4
27.1	27.94	47.8	55.27	80.3	64.82	52.3	44.40	61.8	33.85	62.7
Nov. 6.1	28.35 0.41	44.8 3.0	55.43 0.16	77.3 3.0	64.65 0.17	49.2 3.1	44.07 0.33	59.0 2.8	32.66 1.19	59.9 2.8
16.0	29.11 0.76	42.0 2.8	55.81 0.38	74.5 2.8	64.91 0.26	46.2 3.0	43.97 0.10	56.1 2.9	31.71 0.95	56.8 3.1
26.0	30.22 1.11	39.5 2.5	56.40 0.59	71.9 2.6	65.60 0.69	43.2 3.0	44.09 0.12	53.2 2.9	31.02 0.69	53.4 3.4
Dec. 6.0	31.63 1.41	37.4 1.7	57.19 0.79	69.7 1.7	66.70 1.10	40.5 2.7	44.44 0.35	50.4 2.8	30.62 0.40	49.8 3.6
	1.66	1.7	0.97	1.7	1.48	2.4	0.57	2.7	0.08	3.6
16.0	33.29	35.7	58.16	68.0	68.18	38.1	45.01	47.7	30.54	46.2
25.9	35.15 1.86	34.7 1.0	59.26 1.10	66.7 1.3	69.98 1.80	36.1 2.0	45.79 0.78	45.3 2.4	30.76 0.22	42.6 3.6
35.9	37.15 2.00	34.2 0.5	60.47 1.21	66.0 0.7	72.05 2.07	34.6 1.5	46.74 0.95	43.3 2.0	31.30 0.54	39.2 3.4

# FIXED STARS, 1904.

(CONSTANTS OF PARIS CONFERENCE.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	12 Year Cat. 1879.		$\lambda^1$ Octantis.		$\nu$ Octantis.		$\beta^1$ Octantis.		$\gamma^1$ Octantis.		
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	
	h m 20 51	° +80 11	h m 21 36	° -83 9	h m 22 12	° -86 26	h m 22 36	° -81 52	h m 23 46	° -82 32	
	s	"	s	"	s	"	s	"	s	"	
Jan. 2.1	53.51 <sup>0.67</sup>	51.4 <sup>2.9</sup>	2.55 <sup>0.77</sup>	46.6 <sup>3.0</sup>	63.72 <sup>2.09</sup>	93.3 <sup>2.7</sup>	7.34 <sup>0.99</sup>	79.6 <sup>2.4</sup>	21.85 <sup>1.44</sup>	87.2 <sup>1.6</sup>	
12.1	52.84 <sup>0.46</sup>	48.5 <sup>3.1</sup>	1.78 <sup>0.46</sup>	43.6 <sup>3.2</sup>	61.63 <sup>1.56</sup>	90.6 <sup>3.2</sup>	6.35 <sup>0.78</sup>	77.2 <sup>2.9</sup>	20.41 <sup>1.29</sup>	85.6 <sup>2.2</sup>	
22.1	52.38 <sup>0.23</sup>	45.4 <sup>3.4</sup>	1.32 <sup>0.16</sup>	40.4 <sup>3.5</sup>	60.07 <sup>1.01</sup>	87.4 <sup>3.5</sup>	5.57 <sup>0.56</sup>	74.3 <sup>3.2</sup>	19.12 <sup>1.11</sup>	83.4 <sup>2.6</sup>	
Feb. 1.1	52.16 <sup>0.03</sup>	42.0 <sup>3.4</sup>	1.16 <sup>0.15</sup>	36.9 <sup>3.6</sup>	59.06 <sup>0.42</sup>	83.9 <sup>3.6</sup>	5.01 <sup>0.32</sup>	71.1 <sup>3.5</sup>	18.01 <sup>0.90</sup>	80.8 <sup>3.1</sup>	
11.1	52.19 <sup>0.28</sup>	38.6 <sup>3.3</sup>	1.31 <sup>0.45</sup>	33.3 <sup>3.6</sup>	58.64 <sup>0.14</sup>	80.3 <sup>3.7</sup>	4.69 <sup>0.08</sup>	67.6 <sup>3.6</sup>	17.11 <sup>0.67</sup>	77.7 <sup>3.4</sup>	
	21.1	52.47 <sup>0.51</sup>	35.3 <sup>3.1</sup>	1.76 <sup>0.73</sup>	29.7 <sup>3.6</sup>	58.78 <sup>0.72</sup>	76.6 <sup>0.16</sup>	4.61 <sup>0.16</sup>	64.0 <sup>3.7</sup>	16.44 <sup>0.42</sup>	74.3 <sup>3.6</sup>
Mar. 2.0	52.98 <sup>0.72</sup>	32.2 <sup>2.7</sup>	2.49 <sup>1.00</sup>	26.1 <sup>3.3</sup>	59.50 <sup>1.25</sup>	72.8 <sup>3.6</sup>	4.77 <sup>0.39</sup>	60.3 <sup>3.7</sup>	16.02 <sup>0.18</sup>	70.7 <sup>3.8</sup>	
12.0	53.70 <sup>0.91</sup>	29.5 <sup>2.4</sup>	3.49 <sup>1.23</sup>	22.8 <sup>2.9</sup>	60.75 <sup>1.75</sup>	69.2 <sup>3.5</sup>	5.16 <sup>0.63</sup>	56.6 <sup>3.6</sup>	15.84 <sup>0.08</sup>	66.9 <sup>3.8</sup>	
21.9	54.61 <sup>1.07</sup>	27.1 <sup>1.8</sup>	4.72 <sup>1.45</sup>	19.6 <sup>2.9</sup>	62.50 <sup>2.21</sup>	65.7 <sup>3.3</sup>	5.79 <sup>0.83</sup>	53.0 <sup>3.4</sup>	15.92 <sup>0.34</sup>	63.1 <sup>3.7</sup>	
31.9	55.68 <sup>1.18</sup>	25.3 <sup>1.2</sup>	6.17 <sup>1.64</sup>	16.7 <sup>2.5</sup>	64.71 <sup>2.62</sup>	62.4 <sup>3.0</sup>	6.62 <sup>1.04</sup>	49.6 <sup>3.2</sup>	16.26 <sup>0.58</sup>	59.4 <sup>3.7</sup>	
	10.9	56.86 <sup>1.26</sup>	24.1 <sup>0.6</sup>	7.81 <sup>1.78</sup>	14.2 <sup>2.2</sup>	67.33 <sup>2.96</sup>	59.4 <sup>2.6</sup>	7.66 <sup>1.20</sup>	16.84 <sup>0.82</sup>	55.7 <sup>3.5</sup>	
20.9	58.12 <sup>1.28</sup>	23.5 <sup>0.0</sup>	9.59 <sup>1.89</sup>	12.0 <sup>1.7</sup>	70.29 <sup>3.26</sup>	56.8 <sup>2.1</sup>	8.86 <sup>1.36</sup>	43.5 <sup>2.5</sup>	17.66 <sup>1.03</sup>	52.2 <sup>3.2</sup>	
30.8	59.40 <sup>1.28</sup>	23.5 <sup>0.6</sup>	11.48 <sup>1.96</sup>	10.3 <sup>1.2</sup>	73.55 <sup>3.46</sup>	54.7 <sup>1.7</sup>	10.22 <sup>1.48</sup>	41.0 <sup>2.5</sup>	18.69 <sup>1.23</sup>	49.0 <sup>2.9</sup>	
May 10.8	60.68 <sup>1.22</sup>	24.1 <sup>1.2</sup>	13.44 <sup>2.00</sup>	9.1 <sup>0.8</sup>	77.01 <sup>3.62</sup>	53.0 <sup>1.2</sup>	11.70 <sup>1.57</sup>	38.9 <sup>1.6</sup>	19.92 <sup>1.40</sup>	46.1 <sup>2.4</sup>	
20.8	61.90 <sup>1.14</sup>	25.3 <sup>1.8</sup>	15.44 <sup>1.98</sup>	8.3 <sup>0.2</sup>	80.63 <sup>3.67</sup>	51.8 <sup>0.7</sup>	13.27 <sup>1.62</sup>	37.3 <sup>1.1</sup>	21.32 <sup>1.54</sup>	43.7 <sup>2.0</sup>	
	30.7	63.04 <sup>1.01</sup>	27.1 <sup>2.2</sup>	17.42 <sup>1.93</sup>	8.1 <sup>0.3</sup>	84.30 <sup>3.64</sup>	51.1 <sup>0.2</sup>	14.89 <sup>1.64</sup>	36.2 <sup>0.6</sup>	22.86 <sup>1.61</sup>	41.7 <sup>1.6</sup>
June 9.7	64.05 <sup>0.85</sup>	29.3 <sup>2.2</sup>	19.35 <sup>1.81</sup>	8.4 <sup>0.9</sup>	87.94 <sup>3.54</sup>	50.9 <sup>0.4</sup>	16.53 <sup>1.62</sup>	35.6 <sup>0.0</sup>	24.50 <sup>1.70</sup>	40.1 <sup>0.9</sup>	
19.7	64.90 <sup>0.69</sup>	32.0 <sup>3.0</sup>	21.16 <sup>1.66</sup>	9.3 <sup>1.3</sup>	91.48 <sup>3.33</sup>	51.3 <sup>0.9</sup>	18.15 <sup>1.55</sup>	35.6 <sup>0.5</sup>	26.20 <sup>1.72</sup>	39.2 <sup>0.5</sup>	
29.7	65.59 <sup>0.49</sup>	35.0 <sup>3.3</sup>	22.82 <sup>1.47</sup>	10.6 <sup>1.7</sup>	94.81 <sup>3.03</sup>	52.2 <sup>1.5</sup>	19.70 <sup>1.45</sup>	36.1 <sup>1.0</sup>	27.92 <sup>1.70</sup>	38.7 <sup>0.2</sup>	
July 9.6	66.08 <sup>0.29</sup>	38.3 <sup>3.4</sup>	24.29 <sup>1.23</sup>	12.3 <sup>2.2</sup>	97.84 <sup>2.66</sup>	53.7 <sup>1.9</sup>	21.15 <sup>1.29</sup>	37.1 <sup>1.5</sup>	29.62 <sup>1.61</sup>	38.9 <sup>0.7</sup>	
	19.6	66.37 <sup>0.07</sup>	41.7 <sup>3.6</sup>	25.52 <sup>0.95</sup>	14.5 <sup>2.5</sup>	100.50 <sup>2.20</sup>	55.6 <sup>2.3</sup>	22.44 <sup>1.12</sup>	38.6 <sup>2.0</sup>	31.23 <sup>1.49</sup>	39.6 <sup>1.2</sup>
29.6	66.44 <sup>0.13</sup>	45.3 <sup>3.6</sup>	26.47 <sup>0.66</sup>	17.0 <sup>2.8</sup>	102.70 <sup>1.67</sup>	57.9 <sup>2.6</sup>	23.56 <sup>0.90</sup>	40.6 <sup>2.4</sup>	32.72 <sup>1.32</sup>	40.8 <sup>1.8</sup>	
Aug. 8.6	66.31 <sup>0.34</sup>	48.9 <sup>3.5</sup>	27.13 <sup>0.32</sup>	19.8 <sup>2.9</sup>	104.37 <sup>1.09</sup>	60.5 <sup>2.9</sup>	24.46 <sup>0.65</sup>	43.0 <sup>2.7</sup>	34.04 <sup>1.11</sup>	42.6 <sup>2.2</sup>	
18.5	65.97 <sup>0.54</sup>	52.4 <sup>3.3</sup>	27.45 <sup>0.02</sup>	22.7 <sup>3.0</sup>	105.46 <sup>0.46</sup>	63.4 <sup>3.0</sup>	25.11 <sup>0.37</sup>	45.7 <sup>2.9</sup>	35.15 <sup>0.86</sup>	44.8 <sup>2.6</sup>	
28.5	65.43 <sup>0.72</sup>	55.7 <sup>3.2</sup>	27.43 <sup>0.35</sup>	25.7 <sup>3.0</sup>	105.92 <sup>0.18</sup>	66.4 <sup>3.1</sup>	25.48 <sup>0.10</sup>	48.6 <sup>3.0</sup>	36.01 <sup>0.58</sup>	47.4 <sup>2.8</sup>	
	7.5	64.71 <sup>0.89</sup>	58.9 <sup>2.9</sup>	27.08 <sup>0.67</sup>	28.7 <sup>2.8</sup>	105.74 <sup>0.82</sup>	69.5 <sup>3.1</sup>	25.58 <sup>0.20</sup>	51.6 <sup>3.1</sup>	36.59 <sup>0.29</sup>	50.2 <sup>3.1</sup>
Sept. 17.4	63.82 <sup>1.04</sup>	61.8 <sup>2.6</sup>	26.41 <sup>0.97</sup>	31.5 <sup>2.6</sup>	104.92 <sup>1.44</sup>	72.6 <sup>2.8</sup>	25.38 <sup>0.47</sup>	54.7 <sup>2.9</sup>	36.88 <sup>0.03</sup>	53.3 <sup>3.1</sup>	
27.4	62.78 <sup>1.16</sup>	64.4 <sup>2.1</sup>	25.44 <sup>1.24</sup>	34.1 <sup>2.2</sup>	103.48 <sup>2.02</sup>	75.4 <sup>2.5</sup>	24.91 <sup>0.73</sup>	57.6 <sup>2.8</sup>	36.85 <sup>0.35</sup>	56.4 <sup>3.1</sup>	
Oct. 7.4	61.62 <sup>1.26</sup>	66.5 <sup>1.7</sup>	24.20 <sup>1.45</sup>	36.3 <sup>1.8</sup>	101.45 <sup>2.51</sup>	77.9 <sup>2.2</sup>	24.18 <sup>0.96</sup>	60.4 <sup>2.4</sup>	36.50 <sup>0.63</sup>	59.5 <sup>3.0</sup>	
17.4	60.36 <sup>1.33</sup>	68.2 <sup>1.2</sup>	22.75 <sup>1.61</sup>	38.1 <sup>1.2</sup>	98.95 <sup>2.91</sup>	80.1 <sup>1.7</sup>	23.22 <sup>1.16</sup>	62.8 <sup>1.9</sup>	35.87 <sup>0.91</sup>	62.5 <sup>2.6</sup>	
	27.3	59.03 <sup>1.36</sup>	69.4 <sup>0.7</sup>	21.14 <sup>1.70</sup>	39.3 <sup>0.7</sup>	96.04 <sup>3.20</sup>	81.8 <sup>1.1</sup>	22.06 <sup>1.30</sup>	64.7 <sup>1.5</sup>	34.96 <sup>1.15</sup>	65.1 <sup>2.3</sup>
Nov. 6.3	57.67 <sup>1.35</sup>	70.1 <sup>0.0</sup>	19.44 <sup>1.72</sup>	40.0 <sup>0.0</sup>	92.84 <sup>3.36</sup>	82.9 <sup>0.5</sup>	20.76 <sup>1.40</sup>	66.2 <sup>0.9</sup>	33.81 <sup>1.34</sup>	67.4 <sup>1.8</sup>	
16.3	56.32 <sup>1.32</sup>	70.1 <sup>0.5</sup>	17.72 <sup>1.68</sup>	40.0 <sup>0.6</sup>	89.48 <sup>3.40</sup>	83.4 <sup>0.1</sup>	19.36 <sup>1.44</sup>	67.1 <sup>0.3</sup>	32.47 <sup>1.48</sup>	69.2 <sup>1.2</sup>	
26.3	55.00 <sup>1.25</sup>	69.6 <sup>1.1</sup>	16.04 <sup>1.57</sup>	39.4 <sup>1.2</sup>	86.08 <sup>3.30</sup>	83.3 <sup>0.8</sup>	17.92 <sup>1.43</sup>	67.4 <sup>0.4</sup>	30.99 <sup>1.56</sup>	70.4 <sup>0.6</sup>	
Dec. 6.2	53.75 <sup>1.13</sup>	68.5 <sup>1.6</sup>	14.47 <sup>1.39</sup>	38.2 <sup>1.7</sup>	82.78 <sup>3.10</sup>	82.5 <sup>1.4</sup>	16.49 <sup>1.36</sup>	67.0 <sup>1.0</sup>	29.43 <sup>1.60</sup>	71.0 <sup>0.0</sup>	
	16.2	52.62 <sup>0.99</sup>	66.9 <sup>2.2</sup>	13.08 <sup>1.19</sup>	36.5 <sup>2.3</sup>	79.68 <sup>2.76</sup>	81.1 <sup>2.0</sup>	15.13 <sup>1.25</sup>	66.0 <sup>1.5</sup>	27.83 <sup>1.57</sup>	71.0 <sup>0.6</sup>
26.2	51.63 <sup>0.81</sup>	64.7 <sup>2.7</sup>	11.89 <sup>0.92</sup>	34.2 <sup>2.7</sup>	76.92 <sup>2.35</sup>	79.1 <sup>2.5</sup>	13.88 <sup>1.08</sup>	64.5 <sup>2.1</sup>	26.26 <sup>1.50</sup>	70.4 <sup>1.3</sup>	
36.1	50.82	62.0	10.97	31.5	74.57	76.6	12.80	62.4	24.76	69.1	

## ON THE ARRANGEMENT AND USE OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

---

The first half of this Ephemeris, embracing the positions of the Sun and Moon, the distances of the Moon from the center of the Sun, from the centers of the four most conspicuous planets, and from certain fixed stars, together with the ephemerides of the planets Mercury, Venus, Mars, Jupiter, and Saturn, is designed for the special use of navigators. The remainder of the work is intended to meet the wants of astronomers. It contains the ephemerides of Uranus and Neptune, the heliocentric co-ordinates of the seven major planets, the rectangular equatorial co-ordinates of the Sun, the Moon's longitude and latitude, data for the libration of the Moon, the obliquity of the ecliptic, the nutation, the positions of 383 standard stars, the ephemeris for the meridian of Washington, etc.

### TIME.

Astronomers make use of three different kinds of time, namely: First, true or apparent solar time; second, mean solar time; third, sidereal time.

*True or Apparent Solar Time.*—This species of time is called indiscriminately either true solar time or apparent solar time, and is measured by the motion of the true Sun; the length of the day being the interval between two successive transits of the Sun over the same meridian, and the time of day being always the hour angle of the Sun from the meridian. This is the most obvious and natural measure of time, but owing to the obliquity of the ecliptic and the varying motion of the Earth in its orbit, the intervals between successive returns of the Sun to the same meridian are not exactly equal, and consequently ordinary clocks and chronometers can not be regulated to true solar time.

*Mean Solar Time.*—To avoid the irregularity which would arise from using the true solar day, astronomers have recourse to a mean solar day, whose length is equal to the average of all the true solar days in a year. Just as the true solar day depends upon the motion of the true Sun, so the mean solar day is made to depend upon the motion of an imaginary mean Sun which moves along the equator at a perfectly uniform rate, and whose hour angle from any given meridian is always the mean solar time thereat. Ordinary clocks and watches and the chronometers used by navigators are regulated to this species of time.

*Equation of Time.*—The imaginary mean Sun is supposed to keep as near the true Sun as is consistent with perfect uniformity of motion, but it is sometimes before and sometimes behind the latter, the greatest difference amounting to rather more than one-quarter of an hour. The interval between the true Sun and the imaginary mean Sun is the equation of time, given on pages I and II of the Calendar for the meridian of Greenwich, and a knowledge of it is necessary for converting true solar time into mean solar time, or vice versa. As the mean Sun is an imaginary body, mean solar time can not be directly observed, but it can be got either from observations of the true Sun by applying to them the correction for the equation of time, or from observations of the stars by means of the sidereal time of mean noon, given on page II of the Calendar for the meridian of Greenwich.

*Sidereal Time.*—Sidereal time is measured, roughly speaking, by the daily motion of the stars; or in strict accuracy, by the daily motion of that point in the equator from which the true right ascensions of the stars are counted. The point in question is the vernal equinox, and its hour angle is always the sidereal time. Astronomical clocks are usually regulated to sidereal time, and are then called sidereal clocks.

*Sidereal Day.*—A sidereal day is the interval between two successive transits of the vernal equinox over the same meridian. It is  $3^m\ 55^s.909$  of mean solar time shorter than the mean solar day, the tropical year of 365.2422 solar days, being divided into 366.2422 sidereal days, each comprising 24 sidereal hours. The sidereal hours are counted from 0 to 24, commencing with the instant of the passage of the true vernal equinox over the upper meridian, and ending with its return to the same meridian. About March 23 of each year the sidereal clock agrees with the mean-time or ordinary clock, and the former gains on the latter  $3^m\ 56^s.555$  of sidereal time per day, so that at the end of a year it will have gained an entire day, and will again agree with the mean-time clock.

*Civil Day.*—According to the customs of society, the civil day commences at midnight, and comprises twenty-four hours, which extend to the next following midnight. The hours are counted from 0 to 12 in two series; the first, marked A. M., running from midnight to noon, and the second, marked P. M., running from noon to midnight.

*Astronomical Day.*—The astronomical day begins at noon on the civil day of the same date. It also comprises twenty-four hours, but they are reckoned from 0 to 24, and run from the noon of one day to that of the next following. Astronomical time as well as civil time may be either apparent or mean, according as it is reckoned from apparent noon or from mean noon.

The civil day begins twelve hours before the astronomical day; therefore the first half of the civil day corresponds to the last half of the preceding astronomical day, and the last half of the civil day coincides with the first half of the astronomical day of the same date. Thus, January 9, 2 o'clock, A. M., civil time, is January 8, 14<sup>h</sup>, astronomical time; and January 9, 2 o'clock, P. M., civil time, is also January 9, 2<sup>h</sup>, astronomical time. Hence, we have the following rules:

*To convert Civil Time into Astronomical Time.*—If the civil time is marked A. M., take one from the day and add twelve to the hours, and the result will be the corresponding astronomical time; if the civil time is marked P. M., take away the designation P. M., and the astronomical time will result.

*To convert Astronomical Time into Civil Time.*—If the astronomical time is less than twelve hours, simply write P. M. after it. If greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the days. For example, October 3, 23 hours astronomical time, is October 4, 11 o'clock, A. M., civil time.

*To find Greenwich Time.*—Express the longitude from Greenwich in time, and when west, add it to the local time, or when east, subtract it from the local time. The result will be the corresponding Greenwich time; mean or sidereal, according as the local time employed is mean or sidereal. For use with Part I of this Ephemeris, Greenwich mean time is ordinarily required.

#### PART I—THE EPHEMERIS FOR THE MERIDIAN OF GREENWICH.

Pages 2–217 give data arranged under the heads of the several months, and are therefore designated as the Calendar. Each month covers 18 pages, numbered from I to XVIII, whose contents are as follows:

Page I contains, for Greenwich apparent noon of each day, *The Sun's Apparent Right Ascension and Declination*, and the *Equation of Time*. Adjoining columns contain the differences of these quantities for one hour. By multiplying any one of these differences by

the hours and parts of an hour from Greenwich apparent noon, and adding the product to, or subtracting it from, the corresponding quantity at noon, according as that quantity is increasing or decreasing, we obtain the value of the quantity in question for any given Greenwich apparent time. The hourly differences are given for the instant of apparent noon at Greenwich, but, when great accuracy is required, they should be interpolated for half the hours and parts of an hour of the Greenwich apparent time.

The *Equation of Time* given on page I is the mean time of apparent noon, or the hour-angle of the mean Sun at that instant. The heading of the column directs how the equation is to be applied to apparent time, or the time given by an observation of the Sun, in order to get mean time. When in the course of the month there is a change from addition to subtraction or the reverse (as in the months of April and June), the two different directions are separated by a line, while a corresponding line below points out the dates between which the change occurs.

The *Sun's Semidiameter* and the *Sidereal Time of Semidiameter Passing Meridian* are also given on page I. The semidiameter is used in reducing the altitude of the upper or lower limb of the Sun to the altitude of the center; and in reducing the angular distance between the limb of the Sun and any other object, to the distance from the center of the Sun. The sidereal time of semidiameter passing the meridian is employed in obtaining the passage of the Sun's center over the wires of a transit instrument, when the passage of one limb only has been observed. The quantity found in this column is to be added to the time of transit of the first, or western, limb; and to be subtracted from the time of transit of the second, or eastern, limb.

This page is chiefly used when the Sun is observed on the meridian, at which instant the local apparent time is  $0^h 00^m 00^s$ . The longitude from Greenwich expressed in time is then the corresponding Greenwich apparent time, before or after noon according as the longitude is east or west. The longitude of any place is therefore the factor employed in reducing the quantities on this page to apparent noon at that place.

The right ascension of the Sun thus reduced is the sidereal time of local apparent noon, and the difference between that and the clock time of the meridian passage of the Sun is the error of the clock on sidereal time.

The declination of the Sun reduced to the meridian, or apparent noon, of the place, is required in finding the latitude from a meridian altitude of the Sun.

As an example of the use of page I:—

Let the Sun's declination be required at apparent noon, 1904, April 3, at a place whose longitude is  $89^\circ 40'$ , or  $5^h 58^m 40^s$  east from Greenwich:—

Local apparent time	April 3,	<sup>h</sup> <sup>m</sup> <sup>s</sup>
Longitude from Greenwich (subtractive)		5 58 40
Greenwich apparent time	April 2,	18 1 20

Reducing the minutes and seconds to decimals of an hour, we find that this moment is  $18^h.022$  after Greenwich apparent noon on April 2, or  $5^h.978$  before Greenwich apparent noon on April 3.

On page 56 of the Ephemeris we find that the change of declination in one hour is:

April 2, at Greenwich apparent noon	+	57.64
April 3, at Greenwich apparent noon	+	57.42
Difference for one day	—	0.22

If great exactness is desired, we find the amount of this hourly difference for the time which is halfway between Greenwich noon and the time of observation; that is, for 9 hours

after Greenwich noon of the 2nd, this being half of 18 hours. Nine hours is 0.38 of a day; so the calculation is as follows:

Difference for one hour, April 2	57.64
Change for 0.38 of a day or $0''.22 \times 0.38$	— 0.08
Difference at 9 hours after noon	57.56
$57''.56 \times 18.022 = 1037''.3 = 17' 17''.3$	
Declination at Greenwich noon, April 2	N. 4 52 19.8
Change in 18.022 hours (additive)	17 17.3
Sun's declination at time of observation	N. 5 9 37.1

When the time of observation is only a few hours before Greenwich noon, it may be better to count the longitude backward from this nearest noon. Thus, in the example just given, the time is 5<sup>h</sup>.978 before Greenwich noon of April 3; half this interval is about 0.12 of a day, and the hourly motion for the middle of the interval is 57''.45. Then, we find—

Declination at Greenwich noon, April 3	N. 5 15 20.7
Product of $57''.45 \times 5.978 = 343''.4$ (subtractive)	5 43.4
Sun's declination at time of observation	N. 5 9 37.3

It will always be well to make the calculation in both ways, as a check; but if the results differ slightly, the one derived from the nearest noon should be regarded as the more accurate. At sea, however, it is ordinarily sufficient to compute the declination to the nearest half minute, and the reduction may then be found by Table 12 of BOWDITCH'S *American Practical Navigator*.

Page II contains, for Greenwich mean noon of each day, *The Sun's Apparent Right Ascension and Declination*, the *Equation of Time*, and the *Sidereal Time of Mean Noon*. The hourly changes of these quantities are also given, and may be used in reducing them for the longitude, or to any Greenwich mean time. When great precision is required, these changes should be interpolated for half the Greenwich time, as described in explaining the calculation of the declination.

The *Equation of Time* given on page II is the apparent time of mean noon, and is equivalent to the hour-angle of the true Sun at the instant of mean noon. The heading of the column directs how the equation must be applied to mean time in order to obtain apparent time.

The *Sidereal Time of Mean Noon* is the right ascension of the mean Sun at Greenwich mean noon. It may be reduced for the longitude, or to any Greenwich mean time, by using the hourly difference, 9<sup>s</sup>.8565; or by Table III appended to this volume, for reducing intervals of mean solar to sidereal time; or by Table 9 of BOWDITCH'S *Navigator*.

The right ascensions and declinations on pages I and II are affected both by aberration and nutation, and therefore denote the *apparent* positions of the *true* Sun. Page I is used for observations which depend upon apparent time, as when the Sun is observed on the meridian; while page II is used when the times have been noted by a clock or chronometer regulated to mean time, as is the case in most observations of the Sun out of the meridian.

The Sun's declination is required whenever that body is observed for the purpose of finding latitude, local time, or azimuth, and the equation of time is needed in finding the apparent time when determining the latitude from observations of the Sun out of the meridian.

The sidereal time of mean noon, or right ascension of the mean Sun, is useful in converting mean time to sidereal time. We first find the Greenwich mean time, then the right ascension of the mean Sun for that time, and this being added to the local astronomical mean time will give the sidereal time.



The sidereal time of mean noon, reduced for the longitude of the place, is also used in converting sidereal time to mean time. Subtracting the reduced value from the given sidereal time gives the interval of sidereal time from noon, and that is converted into the required mean time by subtracting from it the corresponding reduction of a sidereal interval to a mean-time interval, taken from Table II appended to this volume, or from Table 8 of BOWDITCH'S *Navigator*. Instead of using Table II, this reduction may be found by multiplying  $9^s.8296$  by the hours and parts of an hour of the sidereal interval from noon.

As examples of the use of page II:—

1.—Let the Sun's right ascension and the equation of time be required for 1904, May 22,  $9^h 2^m 30^s$ , A. M., mean time, at a place whose longitude is  $100^\circ 10'$ , or  $6^h 40^m 40^s$ , west of Greenwich.

Local astronomical mean time	May 21,	$\begin{smallmatrix} h & m & s \\ 21 & 2 & 30 \end{smallmatrix}$
Longitude from Greenwich (additive)		$\begin{smallmatrix} & & s \\ & 6 & 40 & 40 \end{smallmatrix}$
Greenwich mean time	May 22,	$3 \ 43 \ 10 = 3^h.7194$

*Sun's Right Ascension.*

May 22, Greenwich noon	$\begin{smallmatrix} h & m & s \\ 3 & 55 & 11.70 \end{smallmatrix}$
H. D. $10^s.032 \times 3.7194$	$\begin{smallmatrix} & & s \\ + & 0 & 37.31 \end{smallmatrix}$
	$3 \ 55 \ 49.01$

*Equation of Time.*

May 22, Greenwich noon	$\begin{smallmatrix} m & s \\ 3 & 32.21 \end{smallmatrix}$ (additive)
H. D. $-0^s.176 \times 3.72$	$\begin{smallmatrix} & s \\ - & 0.65 \end{smallmatrix}$
	$3 \ 31.56$

In this case the hourly differences interpolated to half the interval, or  $1^h.9$  after noon, have been used. The equation of time is here additive to mean time. Its reduction could have been found by Table 12 of BOWDITCH'S *Navigator*.

2.—If the sidereal time is required for the same date and time, we have—

May 22, sidereal time (at Greenwich mean noon)	$\begin{smallmatrix} h & m & s \\ 3 & 58 & 43.91 \end{smallmatrix}$
Reduction for $3^h 43^m 10^s$ from Table III, or $9^s.8565 \times 3.7194$	$\begin{smallmatrix} & & s \\ + & 0 & 36.66 \end{smallmatrix}$
Add the local astronomical mean time	$\begin{smallmatrix} h & m & s \\ 21 & 2 & 30.00 \end{smallmatrix}$
The required sidereal time is (rejecting $24^h$ )	$1 \ 1 \ 50.57$

The reduction  $0^m 36.66$  could have been found in Table III corresponding to the Greenwich mean time  $3^h 43^m 10^s$ , or by Table 9 of BOWDITCH'S *Navigator*.

3.—On 1904, May 22, A. M., at a place whose longitude is  $100^\circ 10' W.$ , suppose the sidereal time to be  $1^h 1^m 50^s.57$ , and that the corresponding mean time is required.

The astronomical day is May 21; the longitude in time,  $+ 6^h 40^m 40^s$ , or  $+ 6^h.678$ .

May 21, sidereal time (at Greenwich mean noon)	$\begin{smallmatrix} h & m & s \\ 3 & 54 & 47.36 \end{smallmatrix}$
Reduction for $6^h 40^m 40^s$ from Table III, or $9^s.8565 \times 6.678$	$\begin{smallmatrix} & & s \\ + & 1 & 5.82 \end{smallmatrix}$
The sidereal time of local mean noon	$3 \ 55 \ 53.18$
The given sidereal time ( $+ 24^h$ , if necessary for the following subtraction)	$25 \ 1 \ 50.57$
Subtracting the first from the second gives the sidereal interval from noon	$21 \ 5 \ 57.39 = 21^h.0993$
Reduction for $21^h 5^m 57^s.4$ from Table II, or $-9^s.8296 \times 21.0993$	$\begin{smallmatrix} & & s \\ - & 3 & 27.40 \end{smallmatrix}$
The required astronomical mean time is	May 21, $21 \ 2 \ 29.99$

Page III contains, for Greenwich mean noon of each day, *The Sun's True Longitude* and *Latitude*, and the *Logarithm of the Radius Vector of the Earth*. The longitudes of the Sun are the true geometric longitudes, not corrected for aberration. They are given in two columns, headed respectively  $\lambda$  and  $\lambda'$ ;  $\lambda$  representing the Sun's longitude counted from the true equinox of the date; and  $\lambda'$ , the same co-ordinate counted from the mean equinox of the beginning of the Besselian fictitious year. The latitude is referred to the mean ecliptic of the date. Columns of hourly differences are given to facilitate finding the Sun's longitude, or the logarithm of the radius vector, for any hour from noon.

The last column on page III contains the *Mean Time of Sidereal Noon*; that is, the number of hours, minutes, and seconds after Greenwich mean noon when the vernal equinox passes the meridian of Greenwich. It may be reduced to any meridian, or to any Greenwich sidereal time, by using the hourly difference,  $-9^{\text{s}}.8296$  to effect the necessary interpolation. The reduction, however, can be taken directly from Table II for reducing intervals of sidereal time to mean solar time, or from Table 8 of BOWDITCH's *Navigator*.

This column may be used in converting sidereal time to mean time, instead of that on page II. As an illustration, let us take Example 3, above.

It is seen in advance that the sum of the mean time of sidereal noon and the given sidereal time is less than 24 hours. Were it more than 24 hours, the mean time of sidereal noon should be taken out for May 20, that is, the preceding astronomical day.

	h	m	s
May 21, the mean time of Greenwich sidereal noon is . . . . .	20	1	55.20
Reduction for longitude from Table II, or $-9^{\text{s}}.8296 \times 6.678$ . . . . .	—	1	5.64
The mean time of local sidereal noon . . . . .	20	0	49.56
Add the given sidereal time . . . . .	1	1	50.57 = $1^{\text{h}}.0307$
The sum is . . . . .	21	2	40.13
Reduction for $1^{\text{h}} 1^{\text{m}} 50^{\text{s}}.57$ from Table II, or $-9^{\text{s}}.8296 \times 1.0307$ . . . . .	—	0	10.13
The required astronomical mean time . . . . .	May 21, 21	2	30.00

Page IV contains *The Moon's Semidiameter* and *Equatorial Horizontal Parallax*, for each mean noon and midnight at Greenwich. Columns adjoining those of the horizontal parallax give the change of that quantity in one hour, by means of which it can be reduced to any other Greenwich mean time, in the same way as the Sun's declination and the equation of time in the preceding examples. The sign plus or minus is prefixed to the hourly differences, according as the horizontal parallax is increasing or decreasing.

The reduction of the Moon's semidiameter may be readily found by multiplying the reduction of the horizontal parallax by 0.273, or by simply computing the proportional part.

If, for example, the semidiameter of the Moon is to be taken out for 1904, March 19, 10<sup>h</sup>, P. M., Greenwich mean time, we see that the difference of the semidiameters at noon and midnight of March 19 is 3'' 5; then,

$$12^{\text{h}} : 10^{\text{h}} = 3''.5 : 2''.9,$$

which is the correction to be added to the semidiameter at noon, because the semidiameter is increasing. The Moon's semidiameter for March 19, 10<sup>h</sup>, is therefore 15' 6''.8.

The Moon's semidiameter and horizontal parallax are required for all observations of the Moon. When great precision is needed, the hourly differences should be interpolated for half the interval of Greenwich time from noon or midnight, and the horizontal parallax should be corrected for the latitude of the place of observation.

The *Mean Time of the Moon's Upper Transit at Greenwich* and the *Age of the Moon* are also contained on page IV. The time of transit is given to tenths of a minute, and is accompanied by a column of differences for one hour of longitude, by means of which the local time of the Moon's meridian transit may be computed for any other place whose longitude is known. Table 11 of BOWDITCH's *Navigator* furnishes the necessary reduction by simple inspection. The age of the Moon, or the time elapsed since the preceding new Moon, is given to tenths of a day.

Pages V–XII contain *The Moon's Right Ascension* and *Declination* for each day and hour of Greenwich mean time. They are accompanied by columns of differences for one minute, which are also given at each hour. The Greenwich mean time, which is required for taking out these quantities, may either be taken from a well-regulated chronometer, or may be obtained by applying the longitude, converted into time, to the local mean time of the observer. The right ascension or declination is taken out for the given day and hour of

Greenwich mean time; the *Diff. for 1 Minute* is multiplied by the minutes and parts of a minute of the Greenwich time, and the product is added to or subtracted from the quantity, according as the latter is increasing or decreasing.

Thus, suppose the Moon's right ascension and declination are required for 1904, August 20, 10<sup>h</sup> 10<sup>m</sup> 30<sup>s</sup>, astronomical mean time at Greenwich:—

Right Ascension.			Declination.		
August 20, 10 <sup>h</sup>	<sup>n</sup> 18	<sup>m</sup> 0	<sup>s</sup> 51.17	S. 18	18 0.6
Diff. 2 <sup>d</sup> .1992 × 10.5			+ 23.09	— 0	0 5.4
August 20, 10 <sup>h</sup> 10 <sup>m</sup> 30 <sup>s</sup>	18	1	14.26	S. 18	18 6.0

For the sake of precision, the differences here employed have been interpolated for 5<sup>m</sup>.2 — 0<sup>h</sup>.09.

Page XII contains also the *Phases of the Moon* and the dates of the *Moon's Perigee and Apogee*, or least and greatest distances from the Earth.

Pages XIII–XVIII contain the *Lunar Distances*, or the angular distances of the center of the Moon from the center of the Sun, from the centers of the four brighter planets, and from certain fixed stars, as they would appear to an observer at the center of the Earth. They are given for every third hour of Greenwich mean time, and as the reckoning begins at noon, the dates are astronomical. All the distances which can be observed on the same day are grouped together under that date, and the columns are read from left to right, across both pages of the same opening. The letter **W.** or **E.** is affixed to the name of the Sun, planet, or star, to indicate whether it is on the west or east side of the Moon.

An observer on the Earth's surface by measuring a lunar distance, correcting it for errors of his instrument and for the semidiameters of the objects, and clearing it from the effects of refraction and parallax, finds the true or geocentric distance; that is, the distance as it would have appeared from the center of the Earth at the moment of observation. By comparing this distance with the corresponding distances given in the Ephemeris, the Greenwich mean time of the observation can be derived.

To lessen the labor of computation, the Ephemeris contains, between every two successive distances, the logarithm of the seconds of time in which the distance changes one second of arc; or, as it is usually called, the *Proportional Logarithm of the Difference*. It is given for the middle instant of the two hours between which it is placed.

For computing the Greenwich time corresponding to a given lunar distance we have the following rule:

*Find in the Almanac the two distances between which the true distance falls; take out the nearer of these, the hours of Greenwich time over it, and the P. L. of Diff. between them.*

*Find the difference between the true distance and the distance taken from the Almanac; and from the proportional logarithm of this difference, as found in Table 45 of BOWDITCH'S Navigator, subtract the P. L. of Diff. taken from the Almanac.*

*The result will be the proportional logarithm of an interval of time to be added to the hours of Greenwich time, taken from the Almanac, when the earlier Almanac distance is used; or to be subtracted from the hours of Greenwich time, when the later Almanac distance is used.*

Another method is, to add the common logarithm of the difference in seconds between the true and the Almanac distances to the P. L. of Diff. of the Almanac; and then the sum will be the common logarithm of the correction to be applied to the hours of Greenwich time. Table 34 of BOWDITCH'S Navigator saves the operation of reducing degrees (or hours) and minutes to seconds, and the reverse.

As the P. L. of Diff. in the Ephemeris varies continually, the Greenwich time found by the methods just described may not be sufficiently exact. To correct it for such variation, or second difference, take the difference between the P. L. of Diff. used and the one which

follows it in the Ephemeris (or, more strictly, half the difference of the preceding and following ones). With this difference, and the first correction of the Greenwich time already found, enter Table I, appended to this volume, and take out the corresponding seconds, which are to be added to the approximate Greenwich time when the Prop. Logs. in the Ephemeris are decreasing; or subtracted when they are increasing.

Thus the Greenwich mean time of an observation can be ascertained, and if the observer has noted the time of observation by a chronometer, the difference between this chronometer time and the Greenwich mean time will be the error of the chronometer on Greenwich time as found from the lunar distance. In that way lunar distances can be used as a check upon the chronometer, and by a series of them carefully observed on both sides of the Moon, the chronometer error may generally be determined within 20 or 30 seconds.

If the observer has found the local mean time of observation from the observed altitude of one of the bodies, or by a watch regulated to that time by recent observations and corrected for change of longitude in the interval, the difference of this local time and the Greenwich time found from the lunar distance will be his longitude. A longitude derived by this method should always be considered as uncertain by 5' or more.

As an example of finding the Greenwich mean time from a lunar distance, suppose that in 1904, February 10, the corrected distance of the Moon's center from Spica is  $56^{\circ} 18'$ —

Corrected distance . . . . .	56 18 0		
Distance in Ephemeris Feb. 10, VI <sup>b</sup> . . . . .	55 47 7	P. L.	0.2914
Difference . . . . .	0 30 53	P. L.	0.7655
		P. L.	0.4741
Time from VI <sup>b</sup> ( <i>after</i> ) . . . . .	1 0 25		
Corr. for 2d Diff., Table I . . . . .	— 3		
Greenwich mean time Feb. 10 . . . . .	7 0 22		

By a table of common logarithms, or a table of logarithms of small arcs, the reduction of the Greenwich time would be found thus:

From Ephemeris . . . . .	P. L.	0.2914
Diff. of distances, $30' 53'' = 1853''$ . . . . .	log	3.2679
Red. of Greenwich time, $3625^s = 1^h 0^m 25^s$ . . . . .	log	3.5593

The result is the same as by the previous method.

Pages 218–249 contain the geocentric ephemerides of the seven major planets. The places given are apparent positions; that is, they are referred to the equator and true equinox of the date, and are corrected for aberration. All the data except meridian passage are given for the instant of Greenwich mean noon. The column *Meridian Passage* shows the hour, minute, and tenth of that passage of the planet over the meridian of Greenwich which occurs next after the noon of the date.

The right ascension and declination of a planet are required whenever it is observed for time, latitude, or azimuth. The mode of reducing the ephemeris positions of planets to other instants of Greenwich mean time is the same as that given for the Sun on pages 555–557. The local mean time of meridian passage of any planet, at any place, can be found by dividing the proper daily difference of the ephemeris times by 24, multiplying the quotient by the longitude of the place expressed in hours and fractions, and applying the product with its proper sign to the time of Greenwich passage.

Pages 250–271 contain the heliocentric co-ordinates of the seven major planets, and the logarithms of their distances from the Earth. The heliocentric longitude is reckoned, not from the true equinox, as in the preceding ephemerides, but from the mean equinox of the date. It is, therefore, necessary to apply nutation, if the longitude from the true equinox

is required. The daily motion is given for the instant of Greenwich mean noon. The column *Reduction to Orbit* contains the correction to be applied to the heliocentric longitude in order to obtain the longitude counted along the orbit of the planet. The latter is equal to the distance from the mean equinox to the node, plus the distance from the node to the planet. The heliocentric latitude is counted from the mean ecliptic of the date. The *Logarithm of Radius Vector* is the logarithm of the distance of the center of the planet from that of the Sun, at the Greenwich mean noon whose date is given in the first column. The last two columns give, respectively, the logarithm of the true distance of the center of the planet from that of the Earth, for the Greenwich noon indicated on the left-hand side of the page, and for the time which is midway between that date and the date next below it. In the case of Mercury, this intermediate date is mean midnight of the same day; in the case of Venus and Mars, it is the mean noon of the day immediately following; in the case of Jupiter and Saturn, it is mean noon of the second day following; and in the case of Uranus and Neptune, mean noon of the fourth day following.

Pages 272–279 contain the rectangular co-ordinates of the center of the Sun, referred to the center of the Earth as the origin, and to the true equator and equinox of each date as the plane and point of reference. Each co-ordinate is given both for Greenwich mean noon, and for Greenwich mean midnight of the same day. The columns *Reduc. to Mean Eq'x of Jan. 0* give the corrections to be applied to the co-ordinates for noon in order to obtain the corresponding co-ordinates referred to the mean equator and the mean equinox of the beginning of the Besselian fictitious year.

Pages 280–283 give for every Greenwich mean noon and midnight the apparent geocentric longitude and latitude of the Moon referred to the true ecliptic and equinox of the date.

Page 284 contains the position of the Moon's equator, the longitude of the Moon's perigee, the mean longitude of the Moon's ascending node, and the Moon's mean longitude.

Page 285 contains the elements of the libration of the Moon, and the Sun's aberration and horizontal parallax. The epochs of greatest libration of the Moon, together with the formulæ for finding the libration in longitude and latitude, are given on page 441. The *Sun's Aberration* is the quantity which is to be applied to the true longitude of the Sun in order to obtain its apparent longitude. The correction being negative shows that the apparent longitude as affected by aberration is always less than the true longitude. The *Sun's Equatorial Horizontal Parallax*, given in the last column, is the angle subtended by the equatorial radius of the Earth, as seen from the center of the Sun.

Pages 286–288 give data for precession and the obliquity of the ecliptic, together with all sensible terms arising from the motions of the equator and ecliptic. To show clearly the relations of these quantities, let

$\lambda$  = the longitude of any body referred to the true equinox of the date.

$\lambda'$  = the longitude of the same body referred to the mean equinox of the beginning of the Besselian fictitious year.

$\psi_1$  = the adopted value of the general precession.

$\delta'\psi$  = the principal term of the nutation in longitude; or, in other words, the correction to be applied to the longitude of a body referred to the mean equinox of date, in order to obtain that longitude as referred to the true equinox, exclusive of short period terms. When the correction is positive, the longitudes referred to the true equinox are greater than those referred to the mean equinox; while the contrary is the case when the correction has a negative sign.

$\delta''\psi$  = the short period terms of nutation in longitude, given on pages 287–288.

$\omega$  = the true or apparent obliquity of the ecliptic at the date.

$\omega'$  = the mean obliquity of the ecliptic at the beginning of the Besselian fictitious year.

$\delta'\omega$  = the principal term of the nutation of the obliquity of the ecliptic; or, in other words, the correction to be applied to the mean obliquity of date in order to find the true or apparent obliquity, exclusive of short period terms. This quantity is tabulated on page 286, and is positive or negative according as the true obliquity is greater or less than the mean obliquity.

$\delta''\omega$  = the short period terms of nutation in obliquity, given on pages 287-288.

$\tau$  = the fraction of a year intervening between the instant when the Sun's mean longitude was  $280^\circ$  and the date for which  $\lambda$  or  $\omega$  is required.

Then

$$\begin{aligned}\lambda &= \lambda' + \tau \psi_1 + \delta'\psi + \delta''\psi \\ \omega &= \omega' - 0''.464 \tau + \delta'\omega + \delta''\omega\end{aligned}$$

Page 286 contains, for each fifth Greenwich mean noon throughout the year, certain quantities which may be described in terms of the above notation as follows: The *Precession in Longitude from 1904.0*  $= \tau \psi_1$ ; the *Nutation in Longitude*  $= \delta'\psi$ ; the *Nutation in Right Ascension*  $= (\delta'\psi) \cos \omega'$ ; the *Nutation in Obliquity*  $= \delta'\omega$ , and the *Obliquity of the Ecliptic*  $= \omega - \delta''\omega$ , which is the true inclination of the Earth's equator to the ecliptic, exclusive of the terms depending on the Moon's longitude.

Pages 287-288 contain the values of  $\delta''\psi$  and  $\delta''\omega$ , which are not included in the values of nutation given on page 286.

## PART II—THE EPHEMERIS FOR THE MERIDIAN OF WASHINGTON.

Page 290 contains formulæ for reducing the positions of fixed stars, including expressions for the Besselian star-numbers and star-constants, and for the independent star-numbers; the whole based upon the constants of STRUVE and PETERS, and expressed in the notation of BESSEL.

Pages 291-294 contain the logarithms of the *Besselian Star-Numbers*,  $A, B, C, D$ , for each Washington mean midnight, with the values of  $E$  appended at the bottoms of the pages. These numbers serve to reduce the mean place of a star at the beginning of the Besselian fictitious year to its apparent place at the dates for which the numbers are given, and in ordinary cases four figure logarithms suffice; but where extreme accuracy is desired the logarithms of  $A, C$ , and  $D$  are sometimes needed to five places of decimals. If used in accordance with the English and French notation, the pair of quantities  $A$  and  $B$  must be interchanged with the pair  $C$  and  $D$ ; that is,  $A$  must be interchanged with  $C$ , and  $B$  with  $D$ . Along with the solar day, the first column contains the sidereal hour of Washington mean midnight for certain dates, and by interpolation among them it is easy to find the sidereal time for which any set of quantities is given.

The following is an example of the reduction of a star to apparent place by the Besselian star-numbers:—

*Computation of the apparent place of 70 Ophiuchi for 1904, September 3, for the upper transit at Washington.*

	$\log a$	0.4791	$\log b$	4.9034	$\log c$	6.2600	$\log d$	8.8243 <i>n</i>
(Page 293)	$\log A$	9.7906	$\log B$	0.9436	$\log C$	1.2489	$\log D$	0.8226 <i>n</i>
	$\log a'$	8.7378	$\log b'$	0.0000	$\log c'$	9.6788	$\log d'$	6.0791
	$\log A a$	0.2697	$\log B b$	5.8470	$\log C c$	7.5089	$\log D d$	9.6469
	$\log A a'$	8.5284	$\log B b'$	0.9436	$\log C c'$	0.9277	$\log D d'$	6.9017 <i>n</i>

<i>Mean Place, 1904.0,</i>	$a_0$	$\overset{h}{18} \overset{m}{0} \overset{s}{36.150}$	$\delta_0$	$= + 2 \ 31 \ 17.41$
	$A a$	$+ 1.861$	$A a'$	$+ 0.03$
	$B b$	$0.000$	$B b'$	$+ 8.78$
	$C c$	$+ 0.003$	$C c'$	$+ 8.47$
	$D d$	$+ 0.444$	$D d'$	$0.00$
	$E$	$- 0.001$	$\tau \mu'$	$- 0.76$
	$\tau \mu$	$+ 0.012$		
<i>Apparent Place, September 3,</i>	$a$	$\overset{h}{18} \overset{m}{0} \overset{s}{38.469}$	$\delta$	$= + 2 \ 31 \ 33.93$

Pages 295-302 contain the *Independent Star-Numbers*, which can frequently be advantageously used instead of the *Besselian Star-Numbers*. These quantities are connected

with those of BESSEL by the relations given on page 290, which also contains the formulæ and precepts for the application of both systems of numbers. In order to use the Besselian numbers, it is necessary to have the values of the star-constants,  $a, b, c, d, a', b', c', d'$ , while the independent star-numbers render it possible to determine the apparent place of a star without computing these star-constants. Four figure logarithms usually suffice, but where extreme accuracy is desired the logarithms of  $g$  and  $h$  are needed to five places of decimals, and  $G$  and  $H$  are needed to one-tenth of a minute of arc. The column  $\tau$  gives the fraction of a year, counted from the beginning of the Besselian fictitious year to each date.

The following is an example of the reduction of a star to apparent place by the independent star-numbers:—

*Computation of the apparent place of 70 Ophiuchi for 1904, September 3, for the upper transit at Washington.*

$a_0 = 270 \quad 9$		$\delta_0 = + \quad 2 \quad 31$	
$G = 35 \quad 21$		$G + a_0 = 305 \quad 30$	
$H = 110 \quad 32$		$H + a_0 = 20 \quad 41$	
$\log \frac{1}{r}$	8.8239	$\log \frac{1}{r}$	8.8239
$\log g$	1.1813	$\log h$	1.2774
$\log \sin (G + a_0)$	9.9107 <i>n</i>	$\log \sin (H + a_0)$	9.5480
$\log \tan \delta_0$	8.6430	$\log \sec \delta_0$	0.0004
$\log (g)$	8.5589 <i>n</i>	$\log (h)$	9.6497
		<i>Apparent R. A.,</i>	$a =$
			18 0 36.150
		$f =$	+ 1.897
		$(g) =$	- 0.036
		$(h) =$	+ 0.446
		$\tau \mu =$	+ 0.012
			18 0 38.469
$\log g$	1.1813	$\log h$	1.2774
$\log \cos (G + a_0)$	9.7640	$\log \cos (H + a_0)$	9.9711
$\log (g')$	0.9453	$\log \sin \delta_0$	8.6426
		$\log (h')$	9.8911
		$\delta_0 = + \quad 2 \quad 31$	17.41
		$(g') =$	+ 8.82
		$(h') =$	+ 0.78
		$(i) =$	+ 7.69
		$\tau \mu' =$	- 0.76
$\log i$	0.8862	<i>Apparent Dec.,</i>	$\delta = + \quad 2 \quad 31$
$\log \cos \delta_0$	9.9996		33.94
$\log (i)$	0.8858		

Page 303 contains for every tenth sidereal day the *Besselian* and *Independent Star-Numbers*, exclusive of all short period terms. They are useful in computing ephemerides of stars, similar to those on pages 324–399, for which constants containing short period terms should not be employed.

Pages 304–311 contain the mean places of three hundred and eighty-three stars, for the beginning of the Besselian fictitious year 1904, or, in other words, for the moment when the Sun's mean longitude is  $280^\circ$ . The annual variations are to be considered as the differential coefficients of each co-ordinate with respect to the time at the beginning of the year.

Pages 312–323 contain the apparent positions of the five circumpolar stars,  $\alpha, \delta$  and  $\lambda$ -Ursæ Minoris,  $\gamma$ -Cephei, and  $\sigma$ -Octantis, for every upper transit at Washington. The mean solar time of transit is given in the column *Mean Solar Date*, in order that each transit above and below the pole may be readily identified. Suppose, for example, that the transit of Polaris below the pole on January 26 is to be found, and we wish to know whether it precedes or follows the upper transit of the same date. On page 312, we find that the upper transit occurs January 26.2; the lower transit, therefore, occurs January 26.7. But the lower transit following that of July 1 (page 318) does not take place until July 2.3. Hence, the lower transit of July 1 precedes the upper one of the same date. A transit occurring very nearly at noon may also be identified without a computation to ascertain the actual mean date, by simply noting the tenth of a day in the column *Mean Solar Date*.

Pages 324–399 contain, for every tenth upper transit at Washington, the apparent places of 378 stars, being all those given in the list of mean places, except the five circumpolars. The mean solar date in the left hand column of each page gives the day and

tenth of the transit, so that intermediate transits may be readily identified; and to facilitate interpolation, the differences of each co-ordinate are given for every ten days.

Pages 400-407 contain the apparent right ascension and declination of the Sun, both for Washington mean and apparent noon, and the hourly motion of the Sun in these co-ordinates; the equation of time, the semidiameter of the Sun, and the sidereal time of semidiameter passing the meridian, for Washington apparent noon; and lastly, the sidereal time of mean noon. The hours and minutes of right ascension and the degrees and minutes of declination are always made the same for both mean and apparent noon. In cases where they really differ, the minute which would have been numerically larger is diminished by one, and the seconds increased by sixty, so that the sum of the two remains correct. The hourly motions in right ascension and declination are given for the columns headed *Mean Noon*, but may be regarded as having the same values for apparent noon.

The *Equation of Time for Apparent Noon* is the correction to be applied to apparent time in order to obtain mean time. It is, therefore, mean time minus apparent time. Each number as given is the mean time of transit of the Sun's center over the meridian of Washington, counted from the nearest noon. The use of all the quantities is substantially the same as in the *Ephemeris for the Meridian of Greenwich*.

Pages 408-415 contain the right ascension, declination, semidiameter, and parallax of the Moon, at the moment of transit over the meridian of Washington. The mean time given in the second column is that of transit of the Moon's center over this meridian. The differences for one hour of longitude are the amounts by which the local mean times of transit over a meridian one hour west of Washington would exceed those given in the column *Mean Time of Transit*, supposing the rate of change to be uniform and equal to what it is at the instant of transit over the meridian of Washington. The next four columns need no especial explanation, except that the differences for one hour of longitude are computed as if the motion of the Moon in right ascension were uniform, or, in other words, they are differential coefficients corresponding to the instants of Washington transit. By means of them, when second differences are taken into account, the position of the Moon can be computed with great exactness for the moment of transit over any meridian not more than one hour distant from Washington. To obtain the same accuracy for more distant meridians, we may proceed as follows: Let  $F$  represent either the *Mean Time of Transit*, the *Right Ascension of Center*, or the *Geocentric Declination of Center*, and let  $D$  represent the corresponding *Difference for One Hour of Longitude*. Write down three successive values of  $F$ , together with the corresponding values of  $D$ , and difference the latter as in the following scheme; where the middle values,  $F_0$  and  $D_0$ , belong to the Washington culmination from which is to be derived the value of  $F$  for the culmination on the meridian whose longitude is  $\lambda$  :—

Function.	Diff. for 1 Hour of Longitude.	$\Delta'$	$\Delta''$
$F_{-1}$	$D_{-1}$	$a'$	
$F_0$	$D_0$	$a''$	$b$
$F_{+1}$	$D_{+1}$		

Then, for the culmination at the meridian  $\lambda$

$$F_\lambda = F_0 + \lambda D_0 + \frac{\lambda^2}{96} (a' + a'') + \frac{\lambda^3 b}{3456}$$

where  $\lambda$  must be expressed in hours and decimals of an hour, and is to be taken plus or minus according as the longitude from Washington is west or east.



The columns of *Sidereal Time of Semidiameter passing Meridian*, *Geocentric Semidiameter* and *Equatorial Horizontal Parallax*, do not seem to need any explanation, except that they all refer to the moment of transit. The column *Bright Limbs* is given to indicate to the observer which limbs are illuminated. When one limb is full and the terminator is within  $0''.05$  of the opposite limb, both can be well observed, and in such cases both are indicated.

Pages 416–431 contain the geocentric apparent right ascensions and declinations of the seven major planets, together with their horizontal parallaxes, semidiameters, and sidereal times of semidiameters passing the meridian, for the moments of all transits which it is usually desirable to observe over the meridian of Washington. The columns following the dates give the Washington mean times of these transits.

### PART III—PHENOMENA.

This part gives the dates of the principal astronomical phenomena of the year, expressed in Washington mean time, except in the case of the eclipses and the data for the rings of Saturn, which are expressed in Greenwich mean time.

Pages 435–439 contain all necessary data respecting the solar and lunar eclipses which occur during the year.

The eclipse-elements are given for the moment of conjunction of the Sun and Moon in right ascension, but the subsequent tables and results are computed from the exact positions of these bodies at the several instants referred to. The times and angles designated as the circumstances of a lunar eclipse remain the same throughout all parts of the Earth, and require no explanation beyond a mere statement of the fact that in computing them the geometrical diameter of the Earth's shadow has been augmented in the proportion of 51 : 50. The principal circumstances of each total and annular solar eclipse are stated on five lines, as follows:—

The line entitled "Eclipse begins" gives the Greenwich mean time at which the Moon's penumbra first touches the Earth, together with the latitude and longitude of the point of contact.

The line entitled "Central eclipse begins" gives the time when the axis of the Moon's shadow first touches the Earth, and the latitude and longitude of the point of contact follow.

The line entitled "Central eclipse at noon" gives the time when the axes of the Earth and of the shadow cone lie in the same plane. The latitude and longitude of the point where the axis of the shadow cone then cuts the Earth's surface follow, and there the eclipse will be central and the Sun will be exactly on the meridian.

The lines entitled "Central eclipse ends" and "Eclipse ends" give respectively the times when and the localities where these events occur, the phenomena being the converse of those denoted by the similar phrases for the beginning.

In the case of partial solar eclipses the axis of the Moon's shadow does not come into contact with the Earth, and the three lines entitled, respectively, "Central eclipse begins," "Central eclipse at noon," and "Central eclipse ends," are replaced by a single line entitled "Greatest eclipse," whereon are given the time when and the latitude and longitude where the eclipse attains its greatest magnitude. The latter phenomenon necessarily occurs with the Sun in the horizon.

*Maps of the Eclipses.*—The regions in which each eclipse is visible are shown upon the map relating to it, from which may be taken approximately, for any place, both the times of the beginning and ending of the eclipse and its magnitude. The dotted curves show the outlines of the shadow for each hour of Greenwich mean time, and therefore pass through all places where the eclipse begins or ends at the hour indicated. To find the instant of beginning at any place, we determine by inspection between what pair of these curved lines the place is situated. The eclipse will then begin between the corresponding

hours of Greenwich mean time; and the fraction of the hour may be determined by dividing the hour in the same proportion as the space representing it on the map is divided by the place in question. This division may be made a little more exact by allowing for the changes in the spaces as indicated by their varying width. The Greenwich mean time thus found must be reduced to local mean time by applying the longitude.

As an example, suppose we wish to find the times at which the eclipse of 1904, September 9, begins and ends at the place whose latitude is  $10^{\circ}$  S. and whose longitude is  $130^{\circ}$  W.

For the beginning we compare the distance of the place from the curves of  $7^h$  and  $8^h$ , and find it to correspond to about 35 minutes from the former, thus giving for the approximate time of beginning  $7^h 35^m$ ; for the end we compare the distance of the place from the curves of  $10^h$  and  $11^h$ , and find it to be about 28 minutes from the former, thus giving for the approximate time of ending  $10^h 28^m$ , and both of these results are probably correct to within 3 or 4 minutes. Changing to local mean time, we shall have—

		Beginning.			Ending.		
		d	h	m	d	h	m
Greenwich mean time	Sept.	9	7	35	9	10	28
Longitude west			8	40		8	40
Local mean time	Sept.	8	22	55	9	1	48

In the case of total and annular eclipses, a fair estimate of the magnitude of the eclipse at any place may be obtained from the position thereof relatively to the central line and to the limit. On the central line, the eclipse is annular or total, while between the central line and the limit the maximum magnitude of the eclipse is given by the quotient of the distance of the place from the limit divided by the distance of the central line from the limit; the measurements being made upon a line drawn through the place, perpendicularly to the central line.

*More Accurate Computations.*—A more accurate determination of the phases, as visible at any point of the Earth's surface, may be obtained from the Besselian elements which are given for every 10 minutes of Greenwich mean time. Their geometric signification is as follows:—

Let us imagine a plane passing through the center of the Earth, perpendicular to the right line joining the centers of the Sun and Moon. This latter line is the axis of the Moon's shadow, and the plane is called the *fundamental plane* or plane of  $xy$ . We take the intersection of this plane with that of the Earth's equator as the axis of  $x$ , and the center of the Earth as the origin of co-ordinates. The axis of  $y$  is perpendicular to that of  $x$ , and directed toward the north;  $x$  and  $y$  are then the co-ordinates of the point in which the axis of the shadow intersects the fundamental plane, and they are here expressed in terms of the Earth's equatorial radius as unity. The angle  $d$ , of which the sine and cosine are both given, is the declination of that point of the celestial sphere toward which the axis of the shadow is directed; or, in other words, it is the declination of the center of the Sun as seen from the center of the Moon. The angle  $\mu$  is the Greenwich hour-angle of this same point of the celestial sphere.

The quantities  $l_1$  and  $l_2$  are the radii of the shadow-cones upon the fundamental plane,  $l_1$  corresponding to the penumbra, and  $l_2$  to the umbra, or annulus. The notation is that of CHAUVENET'S *Spherical and Practical Astronomy*, in which  $l_2$  is regarded as positive for an annular, and negative for a total eclipse.

The angles  $f_1$  and  $f_2$ , the tangents of which are given, are the angles which the elements of the respective shadow-cones make with the axis of the shadow; or, they are the semi-angles of the two cones.

In order to facilitate interpolation to any required moment, the logarithms of  $x'$ ,  $y'$ , and  $\mu'$ , which are the changes of  $x$ ,  $y$ , and  $\mu$ , in one minute of time, are given at the bottom of the table.

The method of computing an eclipse from its Besselian elements is based on the fact that at the moments of beginning and ending the distance of the observer from the axis of the shadow or penumbra is equal to the radius of the latter at the point of observation. To find this distance and radius we proceed as follows:—

(1) The co-ordinates of the observer,  $\xi$ ,  $\eta$ , and  $\zeta$ , together with their variations in one minute, are computed for some assumed moment of Greenwich mean time, as near as practicable to the true time of the required phase.

(2) The co-ordinates  $x$  and  $y$  of the axis of the shadow, together with their variations in one minute, are taken for the same moment from the tables of elements.

(3) From (1) and (2) the position and motion of the observer relative to the axis of the shadow are found.

(4) The radius of the penumbra or umbra at a distance from the fundamental plane equal to that of the observer is also computed.

(5) Then, assuming the motions to be uniform, we determine the time required for the observer to be brought to a distance from the axis of the shadow equal to this radius.

The formulæ and directions for the several steps in the computation are as follows:—

(1) Find  $\rho \cos \varphi'$  and  $\rho \sin \varphi'$ , which are the geocentric co-ordinates of the station referred to the Earth's equator,  $\rho$  being the distance from the center of the Earth, and  $\varphi'$  the geocentric latitude. These co-ordinates may be obtained from geodetic tables, or may be computed from the following table based on CLARKE'S spheroid of 1866, by the formulæ—

$$\rho \cos \varphi' = F \cos \varphi$$

$$\rho \sin \varphi' = \frac{\sin \varphi}{G}$$

$\varphi$  being, as usual, the geographic latitude.

*Table for Computing the Geocentric Co-ordinates of a Place.*

$\varphi$	Log F.	Log G.
0°	0.00000	0.00295
5	0.00001	0.00294
10	0.00004	0.00291
15	0.00010	0.00285
20	0.00017	0.00278
25	0.00026	0.00269
30	0.00037	0.00258
35	0.00048	0.00247
40	0.00061	0.00234
45	0.00074	0.00221
50	0.00086	0.00209
55	0.00099	0.00196
60	0.00111	0.00184
65	0.00121	0.00174
70	0.00130	0.00165
75	0.00138	0.00157
80	0.00143	0.00152
85	0.00146	0.00149
90	0.00147	0.00147

For the assumed Greenwich mean time of computation, take from the table of elements the values of  $\sin d$ ,  $\cos d$ , and  $\mu$ . Then with  $\lambda$  for the longitude west from Greenwich, the co-ordinates of the observer will be—

$$\xi = \rho \cos \varphi' \sin (\mu - \lambda)$$

$$\eta = \rho \sin \varphi' \cos d - \rho \cos \varphi' \sin d \cos (\mu - \lambda) = \eta_1 - \eta_2$$

$$\zeta = \rho \sin \varphi' \sin d + \rho \cos \varphi' \cos d \cos (\mu - \lambda) = \zeta_1 + \zeta_2$$

and their variations in one minute of mean time will be—

$$\begin{aligned}\xi' &= [7.63992] \rho \cos \varphi' \cos (\mu - \lambda) \\ \eta' &= [7.63992] \rho \cos \varphi' \sin d \sin (\mu - \lambda) = [7.63992] \xi \sin d \\ \zeta' &\text{ is not needed.}\end{aligned}$$

(2) For the same assumed moment of Greenwich mean time, take from the tables of elements the co-ordinates  $x$  and  $y$  of the axis of the shadow, together with their variations for one minute, which are equal to one-tenth of the differences of two consecutive numbers. These variations are represented by  $x'$  and  $y'$ , and their logarithms are given beneath the tables of  $x$  and  $y$ .

(3) The distance  $m$  and position-angle  $M$  of the axis of the shadow relatively to the observer, and the relative motions,  $n$  and  $N$ , are computed by the formulæ—

$$\begin{aligned}m \sin M &= x - \xi \\ m \cos M &= y - \eta \\ n \sin N &= x' - \xi' \\ n \cos N &= y' - \eta'\end{aligned}$$

(4) Both for the shadow and for the penumbra, the radius  $L$  at the distance  $\zeta$  from the fundamental plane is computed by the formula—

$$L = l - \zeta \tan f$$

$l$  and  $f$  being found from the table of elements, and  $\zeta$  computed in (1).

(5) If the time chosen for computation is exactly that of the beginning or ending of the eclipse, we shall have—

$$m = L$$

But, as this condition will rarely be fulfilled on a first trial, a correction  $\tau$  to the assumed time is computed thus: Find the angle  $\psi$  from the equation,

$$\sin \psi = \frac{m \sin (M - N)}{L}$$

There will be two values for this angle, of which one will be in the first and the other in the second quadrant when  $\sin \psi$  is positive, and one in the third and the other in the fourth quadrant when  $\sin \psi$  is negative; but simplicity will be gained by taking only that value of  $\psi$  for which  $\cos \psi$  is positive. This value lies between the limits  $+90^\circ$  and  $-90^\circ$ . The correction  $\tau$  to the assumed time of beginning or ending of the eclipse will then be found, in minutes, from—

$$\tau = - \frac{m \cos (M - N)}{n} \mp \frac{L \cos \psi}{n}$$

where the double sign is to be taken negative for the beginning and positive for the ending.

However, one such pair of values of  $\tau$  can not give the times of both beginning and ending with accuracy. To attain that, we must commence the computation by assuming two times, one near the beginning, and the other near the ending of the eclipse; both of which may be derived from the chart with sufficient exactness. The computation for the first assumed time will give a small value of  $\tau$  which, when applied to the assumed time, will give the beginning of the eclipse nearly correctly, and a large value which will give an inaccurate time of ending. Similarly the computation for the second assumed time will give a small and nearly correct value of  $\tau$ , for finding the time of ending, and a large and inaccurate negative value for finding the time of beginning. We shall thus deduce two times of each phase, only one of which is to be regarded as approximately correct.

The more accurate times of beginning and ending may now be taken in place of those originally assumed, and the whole computation may be repeated, thus leading to a pair of values of  $\tau$ , which should be very small and accurate. Such a repetition of the computation will in general be advisable, to guard against accidental numerical errors, but a second

approximation may be obtained without it, by finding a corrected value of  $\tau$  in accordance with the formulæ—

$$\delta\tau = \mp \frac{\tau(l' + [5.3100] \xi \cos d)}{n \cos \psi} - \frac{[4.9788] \tau^2}{n \cos \psi} [\xi \sin (N \mp \psi) - \eta \cos (N \mp \psi)]$$

$$\tau_0 = \tau + \delta\tau$$

where the double signs are to be taken negative for the beginning of the eclipse and positive for the ending.  $l'$  is the variation of  $l$  for one minute of time, and its numerical value can be taken by inspection from the table of Besselian elements.

If the resulting values of  $\tau_0$  are not greater than fifteen minutes, the corrected times of contact thus obtained will be theoretically exact within less than a second, but the uncertainties of the solar and lunar tables are such that an unavoidable error of several seconds may exist in the prediction. To guard against numerical mistakes it is better, after making this final correction, to repeat the computations so far as to obtain new values of  $m$  and  $L$  for the corrected times. If these two quantities agree within a unit of the fourth place of decimals, the times employed are generally correct within a second of time. If they differ too widely, the computer must use his own judgment as to making further corrections and computations.

*Position-angle of Point of Contact.*—The position-angle  $P$ , of the point of contact, reckoned from the north point of the Sun's limb toward the east, is found by the formula—

$$P = N - \psi \pm 180^\circ \text{ for the beginning,}$$

$$P = N + \psi \quad \text{for the ending,}$$

it being assumed that, in each case, the value of  $\psi$  is taken between the limits  $\pm 90^\circ$ .

*Computation of the Solar Eclipse of 1904, March 16, for Singapore.*

The position of Singapore is—

$$\begin{aligned} \text{Latitude, } \varphi &= + 1^\circ 17' 20'' \\ \text{Longitude, } \lambda &= -103^\circ 51' 18'' \end{aligned}$$

and its geocentric co-ordinates are—

$$\rho \sin \varphi' = 8.34911$$

$$\rho \cos \varphi' = 9.99989$$

From the Eclipse Charts we find the approximate times of the phases to be—

	d	h	m		
Beginning March	16	16	0	}	Greenwich Mean Time.
Ending	16	19	50		
Greenwich Mean Time, $T$ ,	March 16				
				Beginning.	Ending.
				16 <sup>h</sup> 0 <sup>m</sup>	19 <sup>h</sup> 50 <sup>m</sup>
				° ' "	° ' "
		$\mu$	237 50 0		295 21 0
		$\lambda$	— 103 51 18		— 103 51 18
		$\mu - \lambda$	341 41 18		39 12 18
		$\rho \cos \varphi'$	9.99989		9.99989
		$\sin (\mu - \lambda)$	9.49719 $n$		9.80079
		$\log \xi$	9.49708 $n$		9.80068
		$\xi$	— 0.31411		+ 0.63194
		$\rho \sin \varphi'$	8.34911		8.34911
		$\cos d$	9.99984		9.99986
			8.34895		8.34897

Greenwich Mean Time, $T$ ,	March 16	Beginning. 16 <sup>h</sup> 0 <sup>m</sup>	Ending. 19 <sup>h</sup> 50 <sup>m</sup>
	$\eta_1$	+ 0.02233	+ 0.02233
	$\rho \cos \varphi'$	9.99989	9.99989
	$\sin d$	8.42682 $n$	8.40895 $n$
	$\cos (\mu - \lambda)$	9.97743	9.88924
		8.40414 $n$	8.29808 $n$
	$\eta_2$	— 0.02536	— 0.01986
	$\eta = \eta_1 - \eta_2$	+ 0.04769	+ 0.04219
	$\rho \sin \varphi' \sin d$	6.77593 $n$	6.75806 $n$
	$\zeta_1$	— 0.00060	— 0.00057
	$\rho \cos \varphi' \cos d \cos (\mu - \lambda)$	9.97716	9.88899
	$\zeta_2$	+ 0.94878	+ 0.77444
	$\zeta = \zeta_1 + \zeta_2$	+ 0.94818	+ 0.77387
	const. log	7.63992	7.63992
	$\rho \cos \varphi' \cos (\mu - \lambda)$	9.97732	9.88913
	log $\xi'$	7.61724	7.52905
	$\xi'$	+ 0.004142	+ 0.003381
	const. log	7.63992	7.63992
	$\xi \sin d$	7.92390	8.20963 $n$
	log $\eta'$	5.56382	5.84955 $n$
	$\eta'$	+ 0.000037	— 0.000071
	$x - \xi$	— 0.54033	+ 0.37375
	$y - \eta$	— 0.18341	+ 0.41324
	$x' - \xi'$	+ 0.003944	+ 0.004706
	$y' - \eta'$	+ 0.002533	+ 0.002641
	$m \sin M$	9.73266 $n$	9.57258
	$m \cos M$	9.26342 $n$	9.61620
	$\tan M$	0.46924	9.95638
	$M$	251° 15' 3"	42° 7' 38"
	$\sin M$	9.97632 $n$	9.82658
	log $m$	9.75634	9.74600
	$n \sin N$	7.59594	7.67265
	$n \cos N$	7.40364	7.42177
	$\tan N$	0.19230	0.25088
	$N$	57° 17' 24"	60° 41' 56"
	$\sin N$	9.92501	9.94055
	log $n$	7.67093	7.73210
	$\tan f$	7.67196	7.67194
	log $\zeta$	9.97689	9.88866
		7.64885	7.56060
	$\zeta \tan f$	+ 0.00446	+ 0.00364
	$l$	+ 0.56947	+ 0.56920
	$L$	+ 0.56501	+ 0.56556
	$M - N$	193° 57' 39"	341° 25' 42"
	$\sin (M - N)$	9.38248 $n$	9.50309 $n$
	log $m$	9.75634	9.74600
	colog $L$	0.24794	0.24752
	$\sin \psi$	9.38676 $n$	9.49661 $n$

Greenwich Mean Time, $T$ ,	March 16	Beginning. 16 <sup>h</sup> 0 <sup>m</sup>	Ending. 19 <sup>h</sup> 50 <sup>m</sup>
$\phi$		— 14° 6' 7"	— 18° 17' 11"
$\log \frac{m}{n}$		2.08541	2.01390
$\cos (M - N)$		9.98698 $n$	9.97678
		2.07239 $n$	1.99068
$-\frac{m}{n} \cos (M - N)$		+ 118.138	— 97.877
$\log L$		9.75206	9.75248
$\cos \phi$		9.98671	9.97749
$\text{colog } n$		2.32907	2.26790
		2.06784	1.99787
$\mp \frac{L \cos \phi}{n}$		— 116.908	+ 99.510
$\tau$		+ 1.230 <sup>m</sup>	+ 1.633 <sup>m</sup>
$T$		16 0 <sup>h</sup>	19 50 <sup>h</sup>
$T + \tau$		16 1.230	19 51.633
$\lambda$		— 6 55.420	— 6 55.420
Local Mean Time, March		16 <sup>d</sup> 22 <sup>h</sup> 56 <sup>m</sup> .650	17 <sup>d</sup> 2 <sup>h</sup> 47 <sup>m</sup> .053

No correction is necessary, since the assumed times differ very little from the computed ones.

Therefore we have—

Beginning of the eclipse, March	16 <sup>d</sup> 22 <sup>h</sup> 56 <sup>m</sup> 39 <sup>s</sup> .0	} Local Mean Time.
End of the eclipse, " "	17 2 47 3.2	

	Beginning.	Ending.
$N \mp \phi$	71 23.5	42 24.8
constant	+180 0.0	0 0.0
Angle of position: $P$	251 23.5	42 24.8

from the north point of the Sun's disk toward the east for direct image.

*Moon's Phases, Libration, etc.*—Page 440 gives the Washington mean times of the Moon's phases, apogee, perigee and greatest libration, together with the formulæ for finding the libration in longitude and latitude whenever required.

*Mean Places of Stars Occulted During the Year.*—Pages 441–444 contain, for the year 1904, the adopted mean places and annual proper motions, applicable to STRUVE's precession, of such stars as will be occulted by the Moon, but are not included in the list given on pages 304 to 311. These additional stars are necessary in order to provide each month a sufficient number brighter than the 7.55 magnitude which will be occulted at a distance of more than 25° from the Sun.

*Elements of Occultations.*—Pages 445–477 give the elements for the prediction of the times of occultations of stars and planets by the Moon during the current year. The system of co-ordinates employed is similar to that already described for eclipses, the fundamental plane passing through the center of the Earth, and being taken perpendicular to the line joining the star and the center of the Moon, but the cone circumscribing the Moon and star is regarded as a cylinder which intercepts the fundamental plane in a circle having the same linear diameter as the Moon.

In the columns referring to the star, those headed *Red'ns from 1904.0* give the quantities

necessary to reduce the mean place of the star at the beginning of 1904 to its apparent place at the time of occultation. These reductions are sufficiently accurate to be definitive.

Under the general head, *At Conjunction in R. A.*, are five columns giving certain quantities for the moment of geocentric conjunction of the Moon and star in right ascension, as follows:—

The *Washington Mean Time* is the moment,  $T$ , at which the two bodies are in geocentric conjunction in right ascension. At that moment the co-ordinate  $x$  of the axis of the cylinder on the fundamental plane has the value zero. The column *Hour Angle,  $H$* , gives the common geocentric hour-angle of the Moon and star at the same moment, expressed in sidereal time and counted from the meridian of Washington—positive toward the west and negative toward the east. Column  $Y$  gives the co-ordinate  $y$  of the axis of the cylinder upon the fundamental plane at the same moment. Columns  $x'$  and  $y'$  give the variations of  $x$  and  $y$  in one hour of mean time. The linear unit in these columns is the Earth's equatorial radius. The limiting parallels, north and south, show the extreme limits of latitude within which the occultation will be visible.

By the aid of these elements, the Washington mean time of immersion and emersion of a star relatively to the limb of the Moon may be computed for any part of the Earth by a method nearly the same as that already explained for computing eclipses, but somewhat more simple.

*Prediction of Occultations for a Given Place.*—When it is desired to predict the circumstances of one or more occultations at any place, the first step will be to select them from the general list given in the Ephemeris. The conditions of visibility are:—

1. The limiting parallels in the last columns must include the latitude of the place.
2. The quantity  $H - \lambda$ , taken without regard to sign, must be less than the semi-diurnal arc of the star by at least one hour. On very rare occasions an emersion might be seen in the east, or an immersion in the west, when this difference is a few minutes less than an hour.
3. The Sun must not be much more than an hour above the horizon at the local mean time  $T - \lambda$ , unless the star is bright enough to be seen in the daytime.

When many occultations are to be selected, the most convenient course will be to write the value of  $-\lambda$  on the bottom of a slip of paper, and in passing through the list of occultations, to pause over each one for which condition (1) is fulfilled, and examine by means of the slip whether conditions (2) and (3) are also fulfilled. If either fails, the computer passes on. Sometimes it will be difficult to determine whether  $H - \lambda$  or  $T - \lambda$  falls within the limits; and in such cases the computer may mark the occultation for trial and leave the decision for the subsequent operations. The whole list can be gone over in less than a day, and it will probably be found that about one-tenth of the occultations are marked for trial.

The next step will be to compute the local times of immersion and emersion from the elements, and to that end let—

$T$  = the instant of geocentric conjunction of Moon and star in right ascension, expressed in Washington mean solar time;

$H$  = the Washington west hour-angle of the two bodies at that moment;

$\lambda$  = the longitude west of Washington;

$h_0 = H - \lambda$  = the local hour-angle of the star at the instant  $T$ ;

$\delta$  = the star's declination.

The procedure for each occultation will then be as follows:—

(1) The geocentric co-ordinates of the place,  $\rho \sin \varphi'$  and  $\rho \cos \varphi'$ , are to be computed by the formulæ and table given in connection with eclipses on page 567.

The next step will be to find the approximate instant of apparent conjunction of the Moon and star as seen from the place, and that may be deduced from the time of geocen-



tric conjunction by the application of an approximate correction taken from Mr. DOWNES's table, printed in the volumes of the American Ephemeris for 1882 to 1899. This correction must be reckoned in mean solar hours, and will be designated by the symbol  $t$ . It will have the same sign as  $h_0$ .

When DOWNES's table is not available, the correction may be computed from the formulæ,

$$\begin{aligned}\xi_0 &= \rho \cos \varphi' \sin h_0 \\ \xi' &= [9.4192] \cos \frac{4}{3} h_0 \\ t &= \frac{\xi_0}{x' - \xi'}\end{aligned}$$

By applying  $t$  to the Washington mean time of geocentric conjunction, as given with the elements, we shall have the Washington mean time of local conjunction within a few minutes.

(2) Compute for the instant  $T+t$  the following quantities, in which  $t_0$  is the sidereal equivalent of the mean time interval  $t$ :

$$\begin{aligned}\xi &= \rho \cos \varphi' \sin (h_0 + t_0) \\ \eta &= \rho \sin \varphi' \cos \delta - \rho \cos \varphi' \sin \delta \cos (h_0 + t_0) = \eta_1 - \eta_2 \\ \xi' &= [9.4192] \rho \cos \varphi' \cos (h_0 + t_0) \\ \eta' &= [9.4192] \rho \cos \varphi' \sin \delta \sin (h_0 + t_0) = [9.4192] \xi \sin \delta \\ x &= x't \\ y &= Y + y't\end{aligned}$$

Compute also  $m$ ,  $M$ ,  $n$ ,  $N$ , and  $\psi$  from the equations

$$\begin{aligned}m \sin M &= x - \xi \\ m \cos M &= y - \eta \\ n \sin N &= x' - \xi' \\ n \cos N &= y' - \eta' \\ \sin \psi &= [0.5646] m \sin (M - N)\end{aligned}$$

$\psi$  being taken between the limits  $\pm 90^\circ$ . Finally compute

$$\begin{aligned}\tau &= - \frac{[1.7782]m}{n} \cos (M - N) \mp \frac{[1.2135]}{n} \cos \psi \\ \delta\tau &= \frac{[6.7591]\tau^2}{n \cos \psi} [\eta_2 \cos (N \mp \psi) - \xi \sin (N \mp \psi)]\end{aligned}$$

where the double signs are to be taken negative for an immersion and positive for an emersion. Both  $\tau$  and  $\delta\tau$  thus have two values, which are expressed in minutes of time, and in order to distinguish them let those pertaining to immersion be designated respectively  $\tau'$  and  $\delta\tau'$ , while those pertaining to emersion are designated  $\tau''$  and  $\delta\tau''$ . We then have for the Washington mean times of the phases

$$\begin{aligned}\text{Instant of immersion} &= T + t + \tau' + \delta\tau' \\ \text{Instant of emersion} &= T + t + \tau'' + \delta\tau''\end{aligned}$$

These expressions are practically exact, but the corrections  $\delta\tau$  seldom amount to so much as 1.5 minutes, and whenever an inaccuracy of that magnitude is permissible they may be omitted. As a check upon the results, it will be advisable to compute  $\xi$ ,  $\eta$ ,  $x$ , and  $y$  for the times of immersion and emersion finally obtained. If these times are correct the quantities in question will fulfill the condition,

$$\sqrt{(x - \xi)^2 + (y - \eta)^2} = 0.2725$$

If  $\log m \sin (M - N) > 9.4354$ ,  $\sin \psi$  will be numerically greater than unity, and no

occultation is to be expected at the given place; but a very small one may occur if the excess of the computed distance over the Moon's semidiameter happens to be within the errors of the ephemerides of the Moon and star.

The position-angle of the line from the Moon's center to the star, at the time of contact, is reckoned from the north point toward the east, and designated by the symbol  $P$ . It is found from the formula,

$$\begin{aligned} P &= N - \psi + \delta P && \text{for immersion,} \\ P &= N + \psi + \delta P \pm 180^\circ && \text{for emersion,} \end{aligned}$$

where the angles  $N - \psi$  and  $N + \psi$  are taken directly from the computation of  $\delta\tau$ , and  $\delta P$  is got in minutes of arc from the expression

$$\delta P = \mp \frac{[9.0819]\tau^2}{\cos \psi} [\eta_* \sin N + \xi \cos N]$$

In the latter formula the double sign is to be taken negative for an immersion and positive for an emersion.

The angle from the vertex,  $V$ , is also reckoned in the direction from the north toward the east, and is found from the formula,

$$V = P - C$$

where  $C$  is computed from the expression

$$\tan C = \frac{\xi + [8.2218]\tau\xi' - [4.9810]\tau^2\xi}{\eta + [8.2218]\tau\eta' + [4.9810]\tau^2\eta}$$

The value of  $\tau$  employed in the latter formula must be so taken as to correspond with the phase for which  $C$  is required.

In the volumes of the American Ephemeris for the years 1882 to 1901 instructions are given for constructing three special tables which greatly diminish the labor of computing occultations, but as these tables should contain from 4 700 to 6 300 quantities, and as they would apply only to the place for which they were computed, it will rarely be worth while to undertake the labor of forming them. Those who desire further information on the subject may consult any one of the volumes in question.

As an example of an isolated occultation, we will compute that of  $\alpha$  Tauri on March 22, 1904, for Albany, whose position is—

$$\begin{aligned} \varphi &= + 42^\circ 39' 49''.5 \\ \lambda &= - 0^h 13^m 12^s.9 \end{aligned}$$

and whose geocentric co-ordinates are—

$$\begin{aligned} \rho \sin \varphi' &= 9.8288 \\ \rho \cos \varphi' &= 9.8672 \end{aligned}$$

From the elements on page 452, we have

$$\begin{aligned} T &= 7^h 21.9^m \\ H &= + 2 51.8 \end{aligned}$$

and

$$h_0 = H - \lambda = + 3 5.0$$

From DOWNES's table, or from the formulæ on page 573, we find the correction,  $t$ , to the Washington mean time of geocentric conjunction,  $T$ , to be about  $+ 70^m$ ; therefore the Washington mean time of apparent conjunction is—

$$T + t = \text{March } 22^d 8^h 31^m.9.$$

	W. T. of $\delta$	Hour-angle.	$\gamma$	$\alpha'$	$\gamma'$
$\alpha$ TAURI	d h m	h m			
occulted at Albany, N. Y.	Mar. 22 7 21.9	+ 2 51.8	+ 0.4944	0.5710	+ 0.0705

$T + t$ March 22 <sup>d</sup> 8 <sup>h</sup> 31 <sup>m</sup> .9		$x - \xi +$ 0.0052
$h_0$ + 3 5.0		$y - \eta +$ 0.0209
$t_0$ + 1 10.2		$x' - \xi' +$ 0.4856
$h_0 + t_0$ (in arc) + 63° 48'		$y' - \eta' +$ 0.0218
$\rho \cos \varphi'$ 9.8672		$m \sin M$ 7.7160
$\sin (h_0 + t_0)$ 9.9529		$m \cos M$ 8.3201
$\log \xi$ 9.8201		$\tan M$ 9.3959
$\xi$ + 0.6608		$M$ 13° 58'
$\rho \sin \varphi'$ 9.8288		$\cos M$ 9.9870
$\cos \delta$ 9.9822		$\log m$ 8.3331
$\log \eta_1$ 9.8110		$n \sin N$ 9.6863
$\eta_1$ + 0.6471		$n \cos N$ 8.3385
$\rho \cos \varphi'$ 9.8672		$\tan N$ 1.3478
$\sin \delta$ 9.4486		$N$ 87° 26'
$\cos (h_0 + t_0)$ 9.6449		$\sin N$ 9.9996
$\log \eta_2$ 8.9607		$\log n$ 9.6867
$\eta_2$ + 0.0914		const. log 0.5646
$\eta_1 - \eta_2 = \eta$ + 0.5557		$\log m$ 8.3331
const. log 9.4192		$\sin (M - N)$ 9.9817 $n$
$\rho \cos \varphi' \cos (h_0 + t_0)$ 9.5121		$\sin \psi$ 8.8794 $n$
$\log \xi'$ 8.9313		$\psi$ -4° 21'
$\xi'$ + 0.0854		const. log 1.7782
const. log 9.4192		$\log \frac{m}{n}$ 8.6464
$\xi \sin \delta$ 9.2687		$\cos (M - N)$ 9.4542
$\log \eta'$ 8.6879		9.8788
$\eta'$ + 0.0487		$-\frac{[1.7782]}{n} m \cos (M - N)$ -0.76
$\log x'$ 9.7566		const. log 1.2135
$\log t$ 0.0669		colog $n$ 0.3133
$\log x$ 9.8235		$\cos \psi$ 9.9988
$x$ + 0.6660		1.5256
$\log y'$ 8.8482		$\mp \frac{[1.2135]}{n} \cos \psi \mp$ 33.54
$\log y' t$ 8.9151		$\tau$ for immersion - 34.30
$y' t$ + 0.0822		$\tau$ for emersion + 32.78
$Y$ + 0.4944		
$y$ + 0.5766		

The computation of  $\delta\tau$  for the two contacts is as follows:

	Immersion.	Emersion.
$N \mp \psi$	91° 46'	83° 6'
$\cos (N \mp \psi)$	8.4890 $n$	9.0797
$\log \eta_2$	8.9607	8.9607
$\log (1)$	7.4497 $n$	8.0404
(1)	- 0.0028	+ 0.0110
$\sin (N \mp \psi)$	9.9998	9.9968
$\log \xi$	9.8201	9.8201
$\log (2)$	9.8199	9.8169

	Immersion.	Emersion.
(2)	+ 0.6605	+ 0.6560
(1) - (2)	- 0.6633	- 0.6450
log [(1) - (2)]	9.8217 <i>n</i>	9.8096 <i>n</i>
const. log	6.7591	6.7591
log $\tau^2$	3.0706	3.0312
colog ( $n \cos \psi$ )	0.3145	0.3145
log $\delta\tau$	9.9659 <i>n</i>	9.9144 <i>n</i>
$\delta\tau$	— <sup>m</sup> 0.92	— <sup>m</sup> 0.82
$\tau + \delta\tau$	— 35.22	+ 31.96
$T + t$	March <sup>d</sup> 22 <sup>h</sup> 8 <sup>m</sup> 31.9	<sup>h</sup> 8 <sup>m</sup> 31.9
Washington Mean Time of Phase,	" 22 7 56.7	9 3.9
$\lambda$	— 0 13.2	— 0 13.2
Albany Mean Time,	" 22 8 9.9	9 17.1

To find  $\delta P$  and  $P$ :

log $\eta_2$	8.9607	log $\xi$	9.8201	(3)	+ 0.0913
sin $N$	9.9996	cos $N$	8.6511	(4)	+ 0.0296
log (3)	8.9603	log (4)	8.4712	(3) + (4)	+ 0.1209

	Immersion.	Emersion.
log [(3) + (4)]	9.0824	9.0824
const. log	9.0819 <i>n</i>	9.0819
log $\tau^2$	3.0706	3.0312
colog cos $\psi$	0.0012	0.0012
log $\delta P$	1.2361 <i>n</i>	1.1967
$\delta P$	— 0° 17'	+ 0° 16'
$N \mp \psi$	91 46	83 6
constant	0 0	+ 180 0
Angle of position:	$P$ 91° 29'	263° 22'

from the north point of the Moon's limb toward the east, for direct image.

*Occultations Visible at Washington*, pages 478-479.—Here are given in detail all the data necessary for observing every occultation of the general list which is visible at Washington during the current year.

*Phenomena of Planets and Satellites*, pages 480-513.—These are, for the most part, sufficiently explained in the body of the work, but the following additional explanations may be of service in some cases:—

*Disks of Mercury, Venus and Mars*, pages 480-482.—The angle  $\theta$ , needed in reducing meridian observations, is the angle which the arc of the great circle from the planet to the Sun makes with the arc from the planet toward the west, reckoned in the direction west, north, east, south. This position-angle is reckoned from 0° to 360°, as in the measurement of double stars, the planet taking the place of the central star, but its measure is 90° greater than in the case of a double star.

We may also regard  $\theta$  as expressing the angle which the line of cusps makes with the meridian, the positive direction of the meridian being toward the north, and the positive direction of the line of cusps that in which a person following this line would have the illuminated portion of the disk on his right.

*Satellites of Jupiter*, pages 483-507.—The abbreviations designating the phenomena are explained at the foot of each page; the diagram is on page 483.

*Satellites of Saturn*, pages 508-511.—The diagram and explanations are given on pages 508 and 509, the Washington mean times of greatest elongations on pages 509 to 511, and the apparent elements of the rings on page 511.

The diagrams and ephemerides of *The Satellites of Uranus* are given on page 512, and those of *The Satellite of Neptune* on page 513.

*Phenomena*, pages 514-515.—The predicted times of the conjunctions, quadratures, and oppositions of the planets with respect to the Sun are respectively the instants when the longitude of each planet differs from that of the Sun by  $0^\circ$ ,  $\pm 90^\circ$ , or  $180^\circ$ .

For the conjunction of the planets with the Moon, and with each other, the predicted times are the instants when the two bodies have the same right ascension. The degrees and minutes to the right show the difference of declination at the moment of conjunction.

*Positions of Observatories*, pages 516-520.—The latest available data have been used in compiling these positions, and many of them have been furnished through the courtesy of the directors of the several observatories in response to a circular issued by this office. The values given for the *Reduction to Geocentric Latitude* and *Log  $\rho$*  are based upon Col. A. R. CLARKE's elements of the terrestrial spheroid, published in 1866, from which we have—

$$\log e = 8.915\ 2515$$

$$\varphi' - \varphi = -11' \ 40.44'' \sin 2\varphi + 1.19'' \sin 4\varphi$$

$$\log \rho = 9.999\ 2645 + 0.000\ 7374 \cos 2\varphi - 0.000\ 0019 \cos 4\varphi$$

#### PART IV.—STAR NUMBERS, APPARENT PLACES OF STARS, AND OTHER DATA, BASED ON THE CONSTANTS OF THE PARIS CONFERENCE OF MAY, 1896.

Page 522 contains the formulæ for reducing the positions of the fixed stars and for computing the star numbers, the whole expressed in terms of the notation of BESSEL and the constants of the PARIS CONFERENCE of May, 1896.

Page 523 contains the usual data for precession, nutation, obliquity of the ecliptic, and the Sun's aberration, all of which will be rendered sufficiently clear by the explanations given on pages 561-562 respecting the similar data on pages 285-286.

Pages 524-527 contain the logarithms of the *Besselian Star-Numbers* *A*, *B*, *C*, *D*, for each Washington mean midnight, and pages 528-535 contain the *Independent Star-Numbers* for the same dates; to all of which the explanations given on pages 562-563 apply, except that the formulæ on page 522 must be employed instead of those on page 290.

Pages 536-547 contain the apparent positions of the five circumpolar stars,  $\alpha$ ,  $\delta$ , and  $\lambda$  Ursæ Minoris,  $\zeta$  Cephei, and  $\sigma$  Octantis for their upper transit at Washington. The arrangement of the data is the same as on pages 312-323, and consequently the explanations given on page 563 apply here also.

Pages 548-552 contain, for every tenth upper transit at Washington, the apparent places of 25 stars, being all those embraced in the list on pages 304-311 whose declination exceeds  $\pm 78^\circ\ 30'$ , except the five circumpolar stars. For stars of less declination than  $\pm 78^\circ\ 30'$  the apparent places derived by using the constants of the PARIS CONFERENCE differ from those derived by using the constants of STRUVE and PETERS by quantities which never exceed 0.015" in right ascension or 0".05 in declination, and consequently, throughout that range, the places given on pages 324-399 may be regarded as correct for either set of constants; or, in other words, when using the constants of the PARIS CONFERENCE the positions of all stars not contained in pages 536-552 may be taken with

sufficient accuracy from pages 324-399. The explanation on page 563, respecting the data on pages 324-399, applies also to pages 548-552.

*Latitude by Observed Altitude of Polaris*, page 591.—Table IV, page 591, replaces the Tables A, B, C, D, given as a *Supplement* to the volumes of the EPHEMERIS for 1874 to 1881, and is intended for use at sea and reconnaissance on land. It is constructed upon the assumption that Polaris has a declination of  $+88^{\circ} 47'.8$ , and an observed altitude of  $45^{\circ}$ , and will furnish an approximate value of the latitude, the probable error of which, in so far as the table is concerned, will be a few tenths of a minute of arc.

The directions for using the table are adapted to an assumed right ascension of  $1^{\text{h}} 24^{\text{m}}.9$  for Polaris, but somewhat greater accuracy may be insured by substituting the right ascension for the date of observation, from pages 312-323 of this volume.

EPH 1904

# APPENDIX.

## ON THE CONSTRUCTION OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC FOR 1904.

Among American astronomers there are wide differences of opinion respecting the decisions of the PARIS CONFERENCE of May, 1896, and for that reason it has been thought best to give, in the American Ephemeris for 1904, two wholly distinct sets of constants for precession, nutation, aberration, and mean obliquity of the ecliptic, namely: first, those of STRUVE and PETERS, and second, those adopted by the PARIS CONFERENCE of 1896. Their values for 1904.0 are as follows:

	Struve and Peters.	Paris Conference.
Precession . . . . .	50.2647	50.2573
Nutation . . . . .	9.2240	9.21
Aberration . . . . .	20.4451	20.47
Mean Obliquity . . . . .	23° 27' 5".90	23° 27' 6".39

The constants of STRUVE and PETERS are employed in the quantities on pages 286 to 399, and those of the PARIS CONFERENCE in the quantities on pages 522 to 552, and thus everyone is left free to choose between them. For stars distant more than 11° 30' from either pole, the apparent places derived by using the constants of the PARIS CONFERENCE differ from those derived by using the constants of STRUVE and PETERS by quantities which never exceed 0".015 in right ascension, and 0".05 in declination, and consequently throughout that region the star ephemerides given on pages 324 to 399 may be regarded as correct for either set of constants. For the five circumpolar stars, and twenty-five other stars whose declinations exceed  $\pm 78^\circ 30'$  two sets of ephemerides are given; one depending upon the constants of STRUVE and PETERS, and the other depending upon the constants of the PARIS CONFERENCE.

The formulæ for the reduction of stars from mean to apparent place, using the constants of STRUVE and PETERS, are given on page 290.

The nutation given on page 286, and used in the Besselian and independent star-numbers, page 303; in  $f'$ , pages 295 to 302, and in the ephemerides of the apparent places of the fixed stars for every tenth transit, pages 324 to 399, is computed with the values of  $A'$  and  $B'$  given on page 290, while the nutation used in the Besselian and independent star-numbers (except  $f'$ ) given on pages 291 to 302 is computed with the values of  $A$  and  $B$  given on page 290.

In the daily ephemeris of the five circumpolar stars given on pages 312 to 323 the nutation is computed with—

$$\begin{aligned}
 A = & \tau - 0.342\ 53 \sin \Omega \\
 & + 0.004\ 10 \sin 2\Omega \\
 & - 0.025\ 19 \sin 2\odot \\
 & + 0.002\ 93 \sin (\odot + 81^\circ\ 54') \\
 & + 0.000\ 25 \sin (2\odot - \Omega) \\
 & - 0.000\ 11 \sin (3\odot - I') \\
 & - 0.000\ 05 \sin 2(\odot - \Omega) \\
 & + 0.000\ 10 \sin 2(\odot - I'') \\
 & + 0.000\ 09 \sin (2I'' - \Omega) \\
 & + 0.000\ 05 \cos I' \\
 & + 0.000\ 04 \sin 2I'' \\
 & - 0.004\ 05 \sin 2\mathcal{C} \\
 & + 0.001\ 35 \sin (\mathcal{C} - I'')
 \end{aligned}$$

$$\begin{aligned}
 B = & - 9.2240 \cos \Omega \\
 & + 0.0895 \cos 2\Omega \\
 & - 0.5506 \cos 2\odot \\
 & - 0.0092 \cos (\odot + 281^\circ\ 17') \\
 & - 0.0027 \cos (3\odot - I') \\
 & + 0.0067 \cos (2\odot - \Omega) \\
 & + 0.0024 \cos (2I'' - \Omega) \\
 & - 0.0023 \sin I' \\
 & + 0.0008 \cos 2I'' \\
 & - 0.0885 \cos 2\mathcal{C}
 \end{aligned}$$

and the result in right ascension is diminished by the quantity  $f - f' = -0''.1866 \sin 2\zeta + 0''.0622 \sin (\zeta - I'')$ , which is the same for all stars.

The formulæ for the reduction of stars from mean to apparent place, using the constants of the PARIS CONFERENCE, are given on page 522.

The nutation on page 523 includes only the terms in  $\Omega$ ,  $2\Omega$ ,  $L$ ,  $2L$ , and  $3L$ . This value of the nutation has been used in all the ephemerides of the Sun, Moon, and planets, in the apparent places of the stars for every tenth transit given on pages 548 to 552, and in  $f'$  on pages 528 to 535. The nutation used in the daily ephemerides of the circumpolar stars, pages 536 to 547, is computed with—

$$\begin{aligned}
 A = & \tau - 0.34216 \sin \Omega \\
 & + 0.00415 \sin 2\Omega \\
 & - 0.02495 \sin 2L \\
 & + 0.00218 \sin (L + 75.3^\circ) \\
 & - 0.00097 \sin (3L + 78.7^\circ) \\
 & + 0.00025 \sin (2\odot - \Omega) \\
 & - 0.00005 \sin 2(\odot - \Omega) \\
 & + 0.00010 \sin 2(\odot - I'') \\
 & + 0.00009 \sin (2I'' - \Omega) \\
 & + 0.00005 \cos I'' \\
 & + 0.00004 \sin 2I'' \\
 & - 0.00405 \sin 2\zeta \\
 & + 0.00135 \sin (\zeta - I'') \\
 B = & - 9.2100 \cos \Omega \\
 & + 0.0900 \cos 2\Omega \\
 & - 0.5460 \cos 2L \\
 & - 0.0210 \cos (3L + 78.7^\circ) \\
 & + 0.0090 \cos (L - 78.7^\circ) \\
 & + 0.0067 \cos (2\odot - \Omega) \\
 & + 0.0024 \cos (2I'' - \Omega) \\
 & - 0.0023 \sin I'' \\
 & + 0.0008 \cos 2I'' \\
 & - 0.0885 \cos 2\zeta
 \end{aligned}$$

and the result in right ascension is diminished by the quantity  $f - f' = -0''.1866 \sin 2\zeta + 0''.0622 \sin (\zeta - I'')$ , which is the same for all stars.

The terms of short period in the nutation given on pages 287 and 288 are included in the values of the star-numbers on pages 524 to 535. They are derived from manuscript tables of  $A''$  and  $B''$ , in accordance with the formulæ—

$$\begin{aligned}
 \delta''\psi &= \text{Nutation in longitude} = A''\psi \\
 \delta''\omega &= \text{Nutation in obliquity} = -B''
 \end{aligned}$$

where  $\psi$  = the luni-solar precession =  $50''.3710$ , and  $A''$  and  $B''$  are respectively the short period terms in the expressions for  $A$  and  $B$  on page 522. By short period terms are meant all terms involving the Moon's mean longitude.

According to the formulæ on pages 290 and 522, the star constants  $a, b, c, d, a', b', c', d'$ , are computed for each star from its mean place at the beginning of the year, but if strict accuracy is required they should be computed from the star's mean place at date, and the following second order terms should be added to the usual expressions for the reduction from mean to apparent place, namely—

$$\begin{array}{ll}
 \text{To } a - a_0 & \text{To } \delta - \delta_0 \\
 \left. \begin{aligned} & + 0.000003 \tau^2 \sin a \\ & - 0.000149 \tau^2 \cos a \\ & - 0.0000650 \tau^2 \sin 2a \\ & + 0.0000103 \sin 2\Omega \cos 2a \\ & - 0.0000107 \cos 2\Omega \sin 2a \\ & + 0.0000620 \sin 2\odot \cos 2a \\ & - 0.0000622 \cos 2\odot \sin 2a \end{aligned} \right\} \begin{array}{l} \tan \delta \\ \tan^2 \delta \\ \sec^2 \delta \end{array} & \left. \begin{aligned} & + 0.000975 \tau^2 \sin^2 a \\ & - 0.000023 \cos 2\Omega \\ & - 0.000080 \cos 2\Omega \cos 2a \\ & - 0.000077 \sin 2\Omega \sin 2a \\ & + 0.000040 \cos 2\odot \\ & - 0.000467 \cos 2\odot \cos 2a \\ & - 0.000465 \sin 2\odot \sin 2a \end{aligned} \right\} \tan \delta
 \end{array}$$



$$\begin{array}{lcl}
 \text{To } a - a_0 & & \text{To } \delta - \delta_0 \\
 \begin{array}{l}
 + 0.000\,0513 \sin (\odot + \Omega) \cos 2a \\
 - 0.000\,0507 \cos (\odot + \Omega) \sin 2a \\
 + 0.000\,0097 \sin (\odot - \Omega) \cos 2a \\
 - 0.000\,0053 \cos (\odot - \Omega) \sin 2a
 \end{array} & \left. \begin{array}{l} \\ \\ \\ \end{array} \right\} \tan \delta \sec \delta & \begin{array}{l}
 - 0.000\,039 \cos (\odot + \Omega) \\
 - 0.000\,380 \cos (\odot + \Omega) \cos 2a \\
 - 0.000\,385 \sin (\odot + \Omega) \sin 2a \\
 - 0.000\,380 \cos (\odot - \Omega) \\
 - 0.000\,040 \cos (\odot - \Omega) \cos 2a \\
 - 0.000\,072 \sin (\odot - \Omega) \sin 2a
 \end{array} \left. \begin{array}{l} \\ \\ \\ \end{array} \right\} \sin \delta \tan \delta
 \end{array}$$

These terms are negligible for stars whose declination is numerically less than  $80^\circ$ , but in computing the apparent places given in the American Ephemeris they have been applied whenever sensible.

The mean places of 383 stars, pages 304 to 311, are from the new *Catalogue of Fundamental Stars, for the epochs 1875 and 1900, Astronomical Papers of the American Ephemeris*, vol. VIII, part 2, prepared in this office, principally under the direction of Professor NEWCOMB.

The apparent places of Sirius and Procyon have been corrected for the effect of orbital motion, as determined from AUWERS' investigations, and tabulated in *Astronomical Papers of the American Ephemeris*, vol. I, pages 297-298. The values of these corrections are—

Year.	$\Delta a$	$\Delta \delta$	Sirius.	$\Delta a$	$\Delta \delta$	Procyon.
1904.0	$\Delta a = -0.065$	$\Delta \delta = +0.96$	"	$\Delta a = +0.017$	$\Delta \delta = -1.02$	"
1905.0	$\Delta a = -0.079$	$\Delta \delta = +0.85$	"	$\Delta a = +0.006$	$\Delta \delta = -1.05$	"

The ephemeris of the Sun is constructed from Professor NEWCOMB's *Tables of the Sun, Astronomical Papers of the American Ephemeris*, vol. VI, part 1.

The adopted value of the mean equatorial horizontal parallax of the Sun is  $8''.80$ , *Paris Conference, May, 1896*.

The adopted apparent semidiameter of the Sun at the Earth's mean distance is that found by Prof. WM. HARKNESS, from 35 842 meridian observations made at Greenwich, Paris, Washington, Königsberg, Milan, Madras, Dorpat, Modena, and Seeberg, viz.,  $16' 1''.50$ ; while in the computation of eclipses the value given by AUWERS in the *Astronomische Nachrichten*, 1891, Bd. 128, S. 367, is employed, viz.,  $15' 59''.63$ .

The Sun's rectangular equatorial co-ordinates are computed from the longitudes and latitudes by the following formulæ:—

$$\begin{aligned}
 X &= R \cos \lambda \\
 Y &= R \sin \lambda \cos \omega - 19.3 R \beta \\
 Z &= R \sin \lambda \sin \omega + 44.5 R \beta
 \end{aligned}$$

The reductions to mean equinox, 1904.0, are computed by the formulæ—

$$\begin{aligned}
 \Delta X &= + Y \sec \omega \Delta \lambda \sin 1'' \\
 \Delta Y &= - X \cos \omega \Delta \lambda \sin 1'' + Z \Delta \omega \sin 1'' + 9.1 \tau R \sin (\lambda + 6^\circ) \\
 \Delta Z &= - X \sin \omega \Delta \lambda \sin 1'' - Y \Delta \omega \sin 1'' - 21.0 \tau R \sin (\lambda + 6^\circ)
 \end{aligned}$$

where the numerical coefficients are in units of the seventh place of decimals and

$R$  = the Sun's radius vector;

$\lambda$  = the Sun's true longitude;

$\beta$  = the Sun's true latitude, expressed in seconds of arc;

$\omega$  = the obliquity of the ecliptic;

$\Delta \lambda$  = the reduction of longitude for precession and nutation from the beginning of the Besselian fictitious year;

$\Delta \omega$  = the reduction of the mean to the apparent obliquity;

$\tau$  = the fraction of the year since the beginning of the Besselian fictitious year.

The longitude, latitude and parallax of the Moon are derived from HANSEN'S *Tables de la Lune*, London, 1857, the mean longitude being corrected in accordance with Professor NEWCOMB'S *Researches on the Motion of the Moon*, Part I, page 268,\* and Table XXXIV being replaced by a corrected one.

The semidiameter of the Moon is computed from the Moon's equatorial horizontal parallax,  $\pi$ , by the formula,

$$S = 0.272\ 506\ \pi + 1''.50$$

where the constant 0.272 506 is based on data from occultations given by Mr. J. PETERS in the *Astronomische Nachrichten*, 1895, Bd. 138, S. 147; and the constant 1''.50 is added to cover the average effect of irradiation. In the special case where  $\pi = 57'\ 0''$ , this formula agrees with Table XXII of HANSEN'S *Tables de la Lune*, p. 399, and in all other cases it is believed to be preferable to that table. The irradiation constant, 1''.50, is omitted in the computation of eclipses and occultations.

The ephemerides of Mercury, Venus and Mars are derived from Professor NEWCOMB'S tables of these planets, *Astronomical Papers of the American Ephemeris*, vol. VI, parts 2, 3 and 4.

The ephemerides of Jupiter and Saturn are derived from the tables constructed in this office by Dr. GEORGE W. HILL, *Astronomical Papers of the American Ephemeris*, vol. VII, parts 1 and 2.

The ephemeris of Uranus is derived from Professor NEWCOMB'S tables of that planet, *Astronomical Papers of the American Ephemeris*, vol. VII, part 3. The ephemeris of Neptune is derived from Professor NEWCOMB'S tables of that planet, *Astronomical Papers of the American Ephemeris*, vol. VII, part 4.

The semidiameters of the planets are computed from the following values:—

	Semidiameter.	Log Dist.	Authority.
Mercury	3.34	0.00	LE VERRIER, <i>Theory of Mercury</i> .
Venus	8.546 $\pm$ 0.086	0.00	PEIRCE, from the Washington Observations of 1845 and 1846, made with the Mural Circle.
Mars	2.842 $\pm$ 0.057	0.25	
Jupiter (polar)	18.78 $\pm$ 0.067	0.70	
Saturn (polar)	8.77 $\pm$ 0.039	0.95	
Uranus	1.68 $\pm$ 0.3	1.30	
Neptune	1.28	1.48	
Jupiter (equatorial)	20.00	0.70	
Saturn (equatorial)	9.38	0.95	

The elements of eclipses of the Sun and occultations of stars by the Moon are given in accordance with BESSEL'S method, the special forms employed being a modification of those developed in CHAUVENET'S *Spherical and Practical Astronomy*.

The satellites of Mars are computed from manuscript tables based upon elements deduced by Dr. W. S. HARSHMAN. His elements of Deimos are published in the *Astronomical Journal*, 1894, vol. XIV, p. 147; but those of Phobos are yet in manuscript.

The eclipses of Jupiter's satellites are computed from a *Continuation of DAMOISEAU'S Tables*, prepared in this office. The occultations, transits, etc., are computed from WOOLHOUSE'S tables, published in the *British Nautical Almanac* for 1835; Table II of each satellite having been adapted to DAMOISEAU'S tables.

The fifth satellite of Jupiter is computed from manuscript tables based upon unpublished elements deduced by Mr. J. ROBERTSON from observations by Prof. E. E. BARNARD.

The elongations and conjunctions of the six inner satellites of Saturn are computed from manuscript tables prepared in this office by Mr. C. KEITH. These tables are based

\* *Astronomical Observations made at the U. S. Naval Observatory, Washington, 1875, Appendix II.*

upon Prof. A. HALL's elements, as published in the *Washington Observations*, 1883, Appendix I. In the case of the elongations of Mimas and Tethys, however, corrections have been applied to make them conform with the elements of Prof. H. STRUVE, in *Beobachtungen der Saturnstrabanten*, St. Petersburg, 1898. For Hyperion and Iapetus the elongations and conjunctions are computed from Prof. H. STRUVE's elements as published in *Beobachtungen der Saturnstrabanten*, St. Petersburg, 1898.

The apparent elements of the rings of Saturn are computed from BESSEL's data, except those for the dusky ring, which are based on the observations of Messrs. O. STRUVE, A. HALL, E. E. BARNARD and T. LEWIS, at Pulkowa, Washington, Mt. Hamilton and Greenwich.

The elongations of the satellites of Uranus are computed from the data of Professor NEWCOMB's *Uranian and Neptunian Systems*, *Washington Observations*, 1873, Appendix I.

The elongations of the satellite of Neptune are computed from manuscript tables based upon Prof. A. HALL's elements published in the *Astronomical Journal*, 1898, vol. XIX, p. 65.

The following-named persons were engaged in the preparation of the American Ephemeris and Nautical Almanac for the year 1904:

*Assistants and Employés.*—E. J. LOOMIS, W. S. HARSHMAN, H. B. HEDRICK, H. L. RICE, W. AUHAGEN, E. C. RUEBSAM, J. ROBERTSON, H. G. HODGKINS, C. E. VAN ORSTRAND, J. H. ROOT, GEO. B. MERRIMAN, J. C. HAMMOND, C. R. GILLIS, F. E. MILLIS, D. T. WILSON, A. P. AUHAGEN, R. KEITH, R. BUCHANAN, E. B. DAVIS, A. DOOLITTLE, J. MCWILLIAM, and H. F. M. HEDRICK.

EPH 1904

TABLE I.

**CORRECTION, REQUIRED, ON ACCOUNT OF SECOND DIFFERENCES OF THE MOON'S  
MOTION, IN FINDING THE GREENWICH TIME CORRESPONDING  
TO A CORRECTED LUNAR DISTANCE.**

Approximate Interval.		DIFFERENCE OF THE PROPORTIONAL LOGARITHMS IN THE EPHEMERIS.																									
		2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52
h	m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3
0	20	0	1	1	1	1	2	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6
0	30	0	1	1	2	2	2	2	3	3	3	4	4	5	5	5	6	6	6	7	7	7	8	8	8	9	9
0	40	0	1	1	2	2	3	3	3	4	4	5	5	6	6	6	7	7	8	8	9	9	10	10	10	11	11
0	50	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10	10	11	12	12	13	13	13
1	0	1	1	2	2	3	3	4	4	5	6	6	7	7	8	8	9	9	10	10	11	12	12	13	13	14	14
1	10	1	1	2	2	3	4	4	5	5	6	7	7	8	8	9	9	10	11	11	12	12	13	14	14	15	15
1	20	1	1	2	3	3	4	4	5	6	6	7	7	8	9	9	10	10	11	12	12	13	14	14	15	15	16
1	30	1	1	2	3	3	4	4	5	6	6	7	8	8	9	9	10	11	11	12	13	14	14	15	16	16	16
		DIFFERENCE OF THE PROPORTIONAL LOGARITHMS IN THE EPHEMERIS.																									
		54	56	58	60	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100		
h	m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	10	4	4	4	4	4	4	4	4	5	5	5	5	5	5	5	6	6	6	6	6	6	6	6	7	7	
0	20	7	7	7	7	8	8	8	8	9	9	9	9	10	10	10	10	11	11	11	11	12	12	12	12	12	
0	30	9	10	10	10	11	11	12	12	12	13	13	13	14	14	14	15	15	16	16	16	17	17	17	17	17	
0	40	12	12	13	13	13	14	14	15	15	16	16	16	17	17	18	18	19	19	19	20	20	21	21	21	22	
0	50	14	14	15	15	16	16	16	17	17	18	19	19	20	20	21	21	22	22	22	23	23	24	24	24	25	
1	0	15	16	16	17	17	18	18	19	19	20	21	21	22	22	23	23	24	24	25	25	26	27	27	28	28	
1	10	16	17	17	18	18	19	19	20	21	21	22	22	23	24	24	25	25	26	27	27	28	28	29	30	30	
1	20	17	17	18	19	19	20	20	21	21	22	23	23	24	25	25	26	26	27	28	28	29	29	30	31	31	
1	30	17	18	18	19	19	20	21	21	22	23	23	24	24	25	25	26	27	27	28	29	29	30	31	31	31	
		DIFFERENCE OF THE PROPORTIONAL LOGARITHMS IN THE EPHEMERIS.																									
		102	104	106	108	110	112	114	116	118	120	122	124	126	128	130	132	134	136	138							
h	m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	10	7	7	7	7	7	7	7	8	8	8	8	8	8	8	8	8	8	9	9	9	9	9	9	9	9	
0	20	13	13	13	13	14	14	14	14	15	15	15	15	15	15	15	16	16	16	16	17	17	17	17	17	17	
0	30	18	18	18	19	19	19	20	20	20	21	21	21	21	22	22	22	23	23	23	24	24	24	24	24	24	
0	40	22	22	23	23	24	24	25	25	25	26	26	27	27	27	28	28	28	29	29	29	30	30	30	30	30	
0	50	26	26	26	27	27	28	29	29	29	30	30	31	31	32	32	32	33	33	33	34	34	34	34	34	34	
1	0	28	29	29	30	30	31	31	32	33	33	34	34	35	35	36	36	37	37	37	38	38	38	38	38	38	
1	10	30	31	31	32	32	33	34	34	35	35	36	37	37	38	38	39	39	40	40	41	41	41	41	41	41	
1	20	31	32	33	33	34	34	35	35	36	37	38	38	39	39	40	40	41	41	41	42	42	42	42	42	42	
1	30	32	32	33	34	34	35	35	36	36	37	38	39	39	40	40	41	42	42	42	42	42	42	42	42	43	

The correction is to be added to the approximate Greenwich time when the proportional logarithms in the Ephemeris are decreasing, and subtracted when they are increasing.

TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

585

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.									
Side- real.	0 <sup>h</sup>	1 <sup>h</sup>	2 <sup>h</sup>	3 <sup>h</sup>	4 <sup>h</sup>	5 <sup>h</sup>	6 <sup>h</sup>	7 <sup>h</sup>	For Seconds.
m	m s	m s	m s	m s	m s	m s	m s	m s	s s
0	0 0.000	0 9.830	0 19.659	0 29.489	0 39.318	0 49.148	0 58.977	1 8.807	0 0.000
1	0 0.164	0 9.993	0 19.823	0 29.653	0 39.482	0 49.312	0 59.141	1 8.971	1 0.003
2	0 0.328	0 10.157	0 19.987	0 29.816	0 39.646	0 49.475	0 59.305	1 9.135	2 0.005
3	0 0.491	0 10.321	0 20.151	0 29.980	0 39.810	0 49.639	0 59.469	1 9.298	3 0.008
4	0 0.655	0 10.485	0 20.314	0 30.144	0 39.974	0 49.803	0 59.633	1 9.462	4 0.011
5	0 0.819	0 10.649	0 20.478	0 30.308	0 40.137	0 49.967	0 59.796	1 9.626	5 0.014
6	0 0.983	0 10.813	0 20.642	0 30.472	0 40.301	0 50.131	0 59.960	1 9.790	6 0.016
7	0 1.147	0 10.976	0 20.806	0 30.635	0 40.465	0 50.295	1 0.124	1 9.954	7 0.019
8	0 1.311	0 11.140	0 20.970	0 30.799	0 40.629	0 50.458	1 0.288	1 10.118	8 0.022
9	0 1.474	0 11.304	0 21.134	0 30.963	0 40.793	0 50.622	1 0.452	1 10.281	9 0.025
10	0 1.638	0 11.468	0 21.297	0 31.127	0 40.956	0 50.786	1 0.616	1 10.445	10 0.027
11	0 1.802	0 11.632	0 21.461	0 31.291	0 41.120	0 50.950	1 0.779	1 10.609	11 0.030
12	0 1.966	0 11.795	0 21.625	0 31.455	0 41.284	0 51.114	1 0.943	1 10.773	12 0.033
13	0 2.130	0 11.959	0 21.789	0 31.618	0 41.448	0 51.278	1 1.107	1 10.937	13 0.035
14	0 2.294	0 12.123	0 21.953	0 31.782	0 41.612	0 51.441	1 1.271	1 11.100	14 0.038
15	0 2.457	0 12.287	0 22.117	0 31.946	0 41.776	0 51.605	1 1.435	1 11.264	15 0.041
16	0 2.621	0 12.451	0 22.280	0 32.110	0 41.939	0 51.769	1 1.599	1 11.428	16 0.044
17	0 2.785	0 12.615	0 22.444	0 32.274	0 42.103	0 51.933	1 1.762	1 11.592	17 0.046
18	0 2.949	0 12.778	0 22.608	0 32.438	0 42.267	0 52.097	1 1.926	1 11.756	18 0.049
19	0 3.113	0 12.942	0 22.772	0 32.601	0 42.431	0 52.260	1 2.090	1 11.920	19 0.052
20	0 3.277	0 13.106	0 22.936	0 32.765	0 42.595	0 52.424	1 2.254	1 12.083	20 0.055
21	0 3.440	0 13.270	0 23.099	0 32.929	0 42.759	0 52.588	1 2.418	1 12.247	21 0.057
22	0 3.604	0 13.434	0 23.263	0 33.093	0 42.922	0 52.752	1 2.582	1 12.411	22 0.060
23	0 3.768	0 13.598	0 23.427	0 33.257	0 43.086	0 52.916	1 2.745	1 12.575	23 0.063
24	0 3.932	0 13.761	0 23.591	0 33.420	0 43.250	0 53.080	1 2.909	1 12.739	24 0.066
25	0 4.096	0 13.925	0 23.755	0 33.584	0 43.414	0 53.243	1 3.073	1 12.903	25 0.068
26	0 4.259	0 14.089	0 23.919	0 33.748	0 43.578	0 53.407	1 3.237	1 13.066	26 0.071
27	0 4.423	0 14.253	0 24.082	0 33.912	0 43.742	0 53.571	1 3.401	1 13.230	27 0.074
28	0 4.587	0 14.417	0 24.246	0 34.076	0 43.905	0 53.735	1 3.564	1 13.394	28 0.076
29	0 4.751	0 14.581	0 24.410	0 34.240	0 44.069	0 53.899	1 3.728	1 13.558	29 0.079
30	0 4.915	0 14.744	0 24.574	0 34.403	0 44.233	0 54.063	1 3.892	1 13.722	30 0.082
31	0 5.079	0 14.908	0 24.738	0 34.567	0 44.397	0 54.226	1 4.056	1 13.886	31 0.085
32	0 5.242	0 15.072	0 24.902	0 34.731	0 44.561	0 54.390	1 4.220	1 14.049	32 0.087
33	0 5.406	0 15.236	0 25.065	0 34.895	0 44.724	0 54.554	1 4.384	1 14.213	33 0.090
34	0 5.570	0 15.400	0 25.229	0 35.059	0 44.888	0 54.718	1 4.547	1 14.377	34 0.093
35	0 5.734	0 15.563	0 25.393	0 35.223	0 45.052	0 54.882	1 4.711	1 14.541	35 0.096
36	0 5.898	0 15.727	0 25.557	0 35.386	0 45.216	0 55.046	1 4.875	1 14.705	36 0.098
37	0 6.062	0 15.891	0 25.721	0 35.550	0 45.380	0 55.209	1 5.039	1 14.868	37 0.101
38	0 6.225	0 16.055	0 25.885	0 35.714	0 45.544	0 55.373	1 5.203	1 15.032	38 0.104
39	0 6.389	0 16.219	0 26.048	0 35.878	0 45.707	0 55.537	1 5.367	1 15.196	39 0.106
40	0 6.553	0 16.383	0 26.212	0 36.042	0 45.871	0 55.701	1 5.530	1 15.360	40 0.109
41	0 6.717	0 16.546	0 26.376	0 36.206	0 46.035	0 55.865	1 5.694	1 15.524	41 0.112
42	0 6.881	0 16.710	0 26.540	0 36.369	0 46.199	0 56.028	1 5.858	1 15.688	42 0.115
43	0 7.045	0 16.874	0 26.704	0 36.533	0 46.363	0 56.192	1 6.022	1 15.851	43 0.117
44	0 7.208	0 17.038	0 26.867	0 36.697	0 46.527	0 56.356	1 6.186	1 16.015	44 0.120
45	0 7.372	0 17.202	0 27.031	0 36.861	0 46.690	0 56.520	1 6.350	1 16.179	45 0.123
46	0 7.536	0 17.366	0 27.195	0 37.025	0 46.854	0 56.684	1 6.513	1 16.343	46 0.126
47	0 7.700	0 17.529	0 27.359	0 37.188	0 47.018	0 56.848	1 6.677	1 16.507	47 0.128
48	0 7.864	0 17.693	0 27.523	0 37.352	0 47.182	0 57.011	1 6.841	1 16.671	48 0.131
49	0 8.027	0 17.857	0 27.687	0 37.516	0 47.346	0 57.175	1 7.005	1 16.834	49 0.134
50	0 8.191	0 18.021	0 27.850	0 37.680	0 47.510	0 57.339	1 7.169	1 16.998	50 0.137
51	0 8.355	0 18.185	0 28.014	0 37.844	0 47.673	0 57.503	1 7.332	1 17.162	51 0.139
52	0 8.519	0 18.349	0 28.178	0 38.008	0 47.837	0 57.667	1 7.496	1 17.326	52 0.142
53	0 8.683	0 18.512	0 28.342	0 38.171	0 48.001	0 57.831	1 7.660	1 17.490	53 0.145
54	0 8.847	0 18.676	0 28.506	0 38.335	0 48.165	0 57.994	1 7.824	1 17.654	54 0.147
55	0 9.010	0 18.840	0 28.670	0 38.499	0 48.329	0 58.158	1 7.988	1 17.817	55 0.150
56	0 9.174	0 19.004	0 28.833	0 38.663	0 48.492	0 58.322	1 8.152	1 17.981	56 0.153
57	0 9.338	0 19.168	0 28.997	0 38.827	0 48.656	0 58.486	1 8.315	1 18.145	57 0.156
58	0 9.502	0 19.331	0 29.161	0 38.991	0 48.820	0 58.650	1 8.479	1 18.309	58 0.158
59	0 9.666	0 19.495	0 29.325	0 39.154	0 48.984	0 58.814	1 8.643	1 18.473	59 0.161
Side- real.	0 <sup>h</sup>	1 <sup>h</sup>	2 <sup>h</sup>	3 <sup>h</sup>	4 <sup>h</sup>	5 <sup>h</sup>	6 <sup>h</sup>	7 <sup>h</sup>	For Seconds.

TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.										
Side- real.	8 <sup>h</sup>	9 <sup>h</sup>	10 <sup>h</sup>	11 <sup>h</sup>	12 <sup>h</sup>	13 <sup>h</sup>	14 <sup>h</sup>	15 <sup>h</sup>	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	18.636	18.466	18.296	18.125	17.955	17.784	17.614	17.443	0	0.000
1	18.800	18.630	18.459	18.289	18.119	17.948	17.778	17.607	1	0.003
2	18.964	18.794	18.623	18.453	18.282	18.112	17.941	17.771	2	0.005
3	19.128	18.958	18.787	18.617	18.446	18.276	18.105	17.935	3	0.006
4	19.292	19.121	18.951	18.780	18.610	18.440	18.269	18.099	4	0.011
5	19.456	19.285	19.115	18.944	18.774	18.603	18.433	18.263	5	0.014
6	19.619	19.449	19.279	19.108	18.938	18.767	18.597	18.426	6	0.016
7	19.783	19.613	19.442	19.272	19.101	18.931	18.761	18.590	7	0.019
8	19.947	19.777	19.606	19.436	19.265	19.095	18.924	18.754	8	0.022
9	20.111	19.940	19.770	19.600	19.429	19.259	19.088	18.918	9	0.025
10	20.275	20.104	19.934	19.763	19.593	19.423	19.252	19.082	10	0.027
11	20.439	20.268	20.098	19.927	19.757	19.586	19.416	19.245	11	0.030
12	20.602	20.432	20.261	20.091	19.921	19.750	19.580	19.409	12	0.033
13	20.766	20.596	20.425	20.255	20.084	19.914	19.744	19.573	13	0.035
14	20.930	20.760	20.589	20.419	20.248	20.078	19.907	19.737	14	0.038
15	21.094	20.923	20.753	20.583	20.412	20.242	20.071	19.901	15	0.041
16	21.258	21.087	20.917	20.746	20.576	20.405	20.235	20.065	16	0.044
17	21.422	21.251	21.081	20.910	20.740	20.569	20.399	20.228	17	0.046
18	21.585	21.415	21.244	21.074	20.904	20.733	20.563	20.392	18	0.049
19	21.749	21.579	21.408	21.238	21.067	20.897	20.727	20.556	19	0.052
20	21.913	21.743	21.572	21.402	21.231	21.061	20.890	20.720	20	0.055
21	22.077	21.906	21.736	21.565	21.395	21.225	21.054	20.884	21	0.057
22	22.241	22.070	21.900	21.729	21.559	21.388	21.218	21.047	22	0.060
23	22.404	22.234	22.064	21.893	21.723	21.552	21.382	21.211	23	0.063
24	22.568	22.398	22.227	22.057	21.887	21.716	21.546	21.375	24	0.066
25	22.732	22.562	22.391	22.221	22.050	21.880	21.709	21.539	25	0.068
26	22.896	22.726	22.555	22.385	22.214	22.044	21.873	21.703	26	0.071
27	23.060	22.889	22.719	22.548	22.378	22.208	22.037	21.867	27	0.074
28	23.224	23.053	22.883	22.712	22.542	22.371	22.201	22.031	28	0.076
29	23.387	23.217	23.047	22.876	22.706	22.535	22.365	22.194	29	0.079
30	23.551	23.381	23.210	23.040	22.869	22.699	22.529	22.358	30	0.082
31	23.715	23.545	23.374	23.204	23.033	22.863	22.692	22.522	31	0.085
32	23.879	23.708	23.538	23.368	23.197	23.027	22.856	22.686	32	0.087
33	24.043	23.872	23.702	23.531	23.361	23.191	23.020	22.850	33	0.090
34	24.207	24.036	23.866	23.695	23.525	23.354	23.184	23.013	34	0.093
35	24.370	24.200	24.029	23.859	23.689	23.518	23.348	23.177	35	0.096
36	24.534	24.364	24.193	24.023	23.852	23.682	23.512	23.341	36	0.098
37	24.698	24.528	24.357	24.187	24.016	23.846	23.675	23.505	37	0.101
38	24.862	24.691	24.521	24.351	24.180	24.010	23.839	23.669	38	0.104
39	25.026	24.855	24.685	24.514	24.344	24.173	24.003	23.833	39	0.106
40	25.190	25.019	24.849	24.678	24.508	24.337	24.167	23.996	40	0.109
41	25.353	25.183	25.012	24.842	24.672	24.501	24.331	24.160	41	0.112
42	25.517	25.347	25.176	25.006	24.835	24.665	24.495	24.324	42	0.115
43	25.681	25.511	25.340	25.170	24.999	24.829	24.658	24.488	43	0.117
44	25.845	25.674	25.504	25.333	25.163	24.993	24.822	24.652	44	0.120
45	26.009	25.838	25.668	25.497	25.327	25.156	24.986	24.816	45	0.123
46	26.172	26.002	25.832	25.661	25.491	25.320	25.150	24.979	46	0.126
47	26.336	26.166	25.995	25.825	25.655	25.484	25.314	25.143	47	0.128
48	26.500	26.330	26.159	25.989	25.818	25.648	25.477	25.307	48	0.131
49	26.664	26.493	26.323	26.153	25.982	25.812	25.641	25.471	49	0.134
50	26.828	26.657	26.487	26.316	26.146	25.976	25.805	25.635	50	0.137
51	26.992	26.821	26.651	26.480	26.310	26.139	25.969	25.798	51	0.139
52	27.155	26.985	26.815	26.644	26.474	26.303	26.133	25.962	52	0.142
53	27.319	27.149	26.978	26.808	26.637	26.467	26.297	26.126	53	0.145
54	27.483	27.313	27.142	26.972	26.801	26.631	26.460	26.290	54	0.147
55	27.647	27.476	27.306	27.136	26.965	26.795	26.624	26.454	55	0.150
56	27.811	27.640	27.470	27.299	27.129	26.959	26.788	26.618	56	0.153
57	27.975	27.804	27.634	27.463	27.293	27.122	26.952	26.781	57	0.156
58	28.138	27.968	27.797	27.627	27.457	27.286	27.116	26.945	58	0.158
59	28.302	28.132	27.961	27.791	27.620	27.450	27.280	27.109	59	0.161
Side- real.	8 <sup>h</sup>	9 <sup>h</sup>	10 <sup>h</sup>	11 <sup>h</sup>	12 <sup>h</sup>	13 <sup>h</sup>	14 <sup>h</sup>	15 <sup>h</sup>	For Seconds.	

TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

587

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.									
Side- real.	16 <sup>h</sup>	17 <sup>h</sup>	18 <sup>h</sup>	19 <sup>h</sup>	20 <sup>h</sup>	21 <sup>h</sup>	22 <sup>h</sup>	23 <sup>h</sup>	For Seconds
m	m s	m s	m s	m s	m s	m s	m s	m s	s s
0	2 37.273	2 47.102	2 56.932	3 6.762	3 16.591	3 26.421	3 36.250	3 46.080	0 0.000
1	2 37.437	2 47.266	2 57.096	3 6.925	3 16.755	3 26.585	3 36.414	3 46.244	1 0.003
2	2 37.601	2 47.430	2 57.260	3 7.089	3 16.919	3 26.748	3 36.578	3 46.407	2 0.005
3	2 37.764	2 47.594	2 57.424	3 7.253	3 17.083	3 26.912	3 36.742	3 46.571	3 0.008
4	2 37.928	2 47.758	2 57.587	3 7.417	3 17.246	3 27.076	3 36.906	3 46.735	4 0.011
5	2 38.092	2 47.922	2 57.751	3 7.581	3 17.410	3 27.240	3 37.069	3 46.899	5 0.014
6	2 38.256	2 48.085	2 57.915	3 7.745	3 17.574	3 27.404	3 37.233	3 47.063	6 0.016
7	2 38.420	2 48.249	2 58.079	3 7.908	3 17.738	3 27.568	3 37.397	3 47.227	7 0.019
8	2 38.584	2 48.413	2 58.243	3 8.072	3 17.902	3 27.731	3 37.561	3 47.390	8 0.022
9	2 38.747	2 48.577	2 58.406	3 8.236	3 18.066	3 27.895	3 37.725	3 47.554	9 0.025
10	2 38.911	2 48.741	2 58.570	3 8.400	3 18.229	3 28.059	3 37.889	3 47.718	10 0.027
11	2 39.075	2 48.905	2 58.734	3 8.564	3 18.393	3 28.223	3 38.052	3 47.882	11 0.030
12	2 39.239	2 49.068	2 58.898	3 8.728	3 18.557	3 28.387	3 38.216	3 48.046	12 0.033
13	2 39.403	2 49.232	2 59.062	3 8.891	3 18.721	3 28.550	3 38.380	3 48.210	13 0.035
14	2 39.566	2 49.396	2 59.226	3 9.055	3 18.885	3 28.714	3 38.544	3 48.373	14 0.038
15	2 39.730	2 49.560	2 59.389	3 9.219	3 19.049	3 28.878	3 38.708	3 48.537	15 0.041
16	2 39.894	2 49.724	2 59.553	3 9.383	3 19.212	3 29.042	3 38.871	3 48.701	16 0.044
17	2 40.058	2 49.888	2 59.717	3 9.547	3 19.376	3 29.206	3 39.035	3 48.865	17 0.046
18	2 40.222	2 50.051	2 59.881	3 9.710	3 19.540	3 29.370	3 39.199	3 49.029	18 0.049
19	2 40.386	2 50.215	3 0.045	3 9.874	3 19.704	3 29.533	3 39.363	3 49.193	19 0.052
20	2 40.549	2 50.379	3 0.209	3 10.038	3 19.868	3 29.697	3 39.527	3 49.356	20 0.055
21	2 40.713	2 50.543	3 0.372	3 10.202	3 20.032	3 29.861	3 39.691	3 49.520	21 0.057
22	2 40.877	2 50.707	3 0.536	3 10.366	3 20.195	3 30.025	3 39.854	3 49.684	22 0.060
23	2 41.041	2 50.870	3 0.700	3 10.530	3 20.359	3 30.189	3 40.018	3 49.848	23 0.063
24	2 41.205	2 51.034	3 0.864	3 10.693	3 20.523	3 30.353	3 40.182	3 50.012	24 0.066
25	2 41.369	2 51.198	3 1.028	3 10.857	3 20.687	3 30.516	3 40.346	3 50.175	25 0.068
26	2 41.532	2 51.362	3 1.192	3 11.021	3 20.851	3 30.680	3 40.510	3 50.339	26 0.071
27	2 41.696	2 51.526	3 1.355	3 11.185	3 21.014	3 30.844	3 40.674	3 50.503	27 0.074
28	2 41.860	2 51.690	3 1.519	3 11.349	3 21.178	3 31.008	3 40.837	3 50.667	28 0.076
29	2 42.024	2 51.853	3 1.683	3 11.513	3 21.342	3 31.172	3 41.001	3 50.831	29 0.079
30	2 42.188	2 52.017	3 1.847	3 11.676	3 21.506	3 31.336	3 41.165	3 50.995	30 0.082
31	2 42.352	2 52.181	3 2.011	3 11.840	3 21.670	3 31.499	3 41.329	3 51.159	31 0.085
32	2 42.515	2 52.345	3 2.174	3 12.004	3 21.834	3 31.663	3 41.493	3 51.322	32 0.087
33	2 42.679	2 52.509	3 2.338	3 12.168	3 21.997	3 31.827	3 41.657	3 51.486	33 0.090
34	2 42.843	2 52.673	3 2.502	3 12.332	3 22.161	3 31.991	3 41.820	3 51.650	34 0.093
35	2 43.007	2 52.836	3 2.666	3 12.496	3 22.325	3 32.155	3 41.984	3 51.814	35 0.096
36	2 43.171	2 53.000	3 2.830	3 12.659	3 22.489	3 32.318	3 42.148	3 51.978	36 0.098
37	2 43.334	2 53.164	3 2.994	3 12.823	3 22.653	3 32.482	3 42.312	3 52.141	37 0.101
38	2 43.498	2 53.328	3 3.157	3 12.987	3 22.817	3 32.646	3 42.476	3 52.305	38 0.104
39	2 43.662	2 53.492	3 3.321	3 13.151	3 22.980	3 32.810	3 42.639	3 52.469	39 0.106
40	2 43.826	2 53.656	3 3.485	3 13.315	3 23.144	3 32.974	3 42.803	3 52.633	40 0.109
41	2 43.990	2 53.819	3 3.649	3 13.478	3 23.308	3 33.138	3 42.967	3 52.797	41 0.112
42	2 44.154	2 53.983	3 3.813	3 13.642	3 23.472	3 33.301	3 43.131	3 52.961	42 0.115
43	2 44.317	2 54.147	3 3.977	3 13.806	3 23.636	3 33.465	3 43.295	3 53.124	43 0.117
44	2 44.481	2 54.311	3 4.140	3 13.970	3 23.800	3 33.629	3 43.459	3 53.288	44 0.120
45	2 44.645	2 54.475	3 4.304	3 14.134	3 23.963	3 33.793	3 43.622	3 53.452	45 0.123
46	2 44.809	2 54.638	3 4.468	3 14.298	3 24.127	3 33.957	3 43.786	3 53.616	46 0.126
47	2 44.973	2 54.802	3 4.632	3 14.461	3 24.291	3 34.121	3 43.950	3 53.780	47 0.128
48	2 45.137	2 54.966	3 4.796	3 14.625	3 24.455	3 34.284	3 44.114	3 53.944	48 0.131
49	2 45.300	2 55.130	3 4.960	3 14.789	3 24.619	3 34.448	3 44.278	3 54.107	49 0.134
50	2 45.464	2 55.294	3 5.123	3 14.953	3 24.782	3 34.612	3 44.442	3 54.271	50 0.137
51	2 45.628	2 55.458	3 5.287	3 15.117	3 24.946	3 34.776	3 44.605	3 54.435	51 0.139
52	2 45.792	2 55.621	3 5.451	3 15.281	3 25.110	3 34.940	3 44.769	3 54.599	52 0.142
53	2 45.956	2 55.785	3 5.615	3 15.444	3 25.274	3 35.104	3 44.933	3 54.763	53 0.145
54	2 46.120	2 55.949	3 5.779	3 15.608	3 25.438	3 35.267	3 45.097	3 54.926	54 0.147
55	2 46.283	2 56.113	3 5.942	3 15.772	3 25.602	3 35.431	3 45.261	3 55.090	55 0.150
56	2 46.447	2 56.277	3 6.106	3 15.936	3 25.765	3 35.595	3 45.425	3 55.254	56 0.153
57	2 46.611	2 56.441	3 6.270	3 16.100	3 25.929	3 35.759	3 45.588	3 55.418	57 0.156
58	2 46.775	2 56.604	3 6.434	3 16.264	3 26.093	3 35.923	3 45.752	3 55.582	58 0.158
59	2 46.939	2 56.768	3 6.598	3 16.427	3 26.257	3 36.086	3 45.916	3 55.746	59 0.161
Side- real.	16 <sup>h</sup>	17 <sup>h</sup>	18 <sup>h</sup>	19 <sup>h</sup>	20 <sup>h</sup>	21 <sup>h</sup>	22 <sup>h</sup>	23 <sup>h</sup>	For Seconds.

TABLE III.—MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.										
Mean Solar.	0 <sup>h</sup>	1 <sup>h</sup>	2 <sup>h</sup>	3 <sup>h</sup>	4 <sup>h</sup>	5 <sup>h</sup>	6 <sup>h</sup>	7 <sup>h</sup>	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	0 0.000	0 9.856	0 19.713	0 29.569	0 39.426	0 49.282	0 59.139	1 8.995	0	0.000
1	0 0.164	0 10.021	0 19.877	0 29.734	0 39.590	0 49.447	0 59.303	1 9.160	1	0.003
2	0 0.329	0 10.185	0 20.041	0 29.898	0 39.754	0 49.611	0 59.467	1 9.324	2	0.005
3	0 0.493	0 10.349	0 20.206	0 30.062	0 39.919	0 49.775	0 59.632	1 9.488	3	0.008
4	0 0.657	0 10.514	0 20.370	0 30.227	0 40.083	0 49.939	0 59.796	1 9.652	4	0.011
5	0 0.821	0 10.678	0 20.534	0 30.391	0 40.247	0 50.104	0 59.960	1 9.817	5	0.014
6	0 0.986	0 10.842	0 20.699	0 30.555	0 40.412	0 50.268	1 0.124	1 9.981	6	0.016
7	0 1.150	0 11.006	0 20.863	0 30.719	0 40.576	0 50.432	1 0.289	1 10.145	7	0.019
8	0 1.314	0 11.171	0 21.027	0 30.884	0 40.740	0 50.597	1 0.453	1 10.310	8	0.022
9	0 1.478	0 11.335	0 21.191	0 31.048	0 40.904	0 50.761	1 0.617	1 10.474	9	0.025
10	0 1.643	0 11.499	0 21.356	0 31.212	0 41.069	0 50.925	1 0.782	1 10.638	10	0.027
11	0 1.807	0 11.663	0 21.520	0 31.376	0 41.233	0 51.089	1 0.946	1 10.802	11	0.030
12	0 1.971	0 11.828	0 21.684	0 31.541	0 41.397	0 51.254	1 1.110	1 10.967	12	0.033
13	0 2.136	0 11.992	0 21.849	0 31.705	0 41.561	0 51.418	1 1.274	1 11.131	13	0.036
14	0 2.300	0 12.156	0 22.013	0 31.869	0 41.726	0 51.582	1 1.439	1 11.295	14	0.038
15	0 2.464	0 12.321	0 22.177	0 32.034	0 41.890	0 51.746	1 1.603	1 11.459	15	0.041
16	0 2.628	0 12.485	0 22.341	0 32.198	0 42.054	0 51.911	1 1.767	1 11.624	16	0.044
17	0 2.793	0 12.649	0 22.506	0 32.362	0 42.219	0 52.075	1 1.932	1 11.788	17	0.047
18	0 2.957	0 12.813	0 22.670	0 32.526	0 42.383	0 52.239	1 2.096	1 11.952	18	0.049
19	0 3.121	0 12.978	0 22.834	0 32.691	0 42.547	0 52.404	1 2.260	1 12.117	19	0.052
20	0 3.285	0 13.142	0 22.998	0 32.855	0 42.711	0 52.568	1 2.424	1 12.281	20	0.055
21	0 3.450	0 13.306	0 23.163	0 33.019	0 42.876	0 52.732	1 2.589	1 12.445	21	0.057
22	0 3.614	0 13.471	0 23.327	0 33.183	0 43.040	0 52.896	1 2.753	1 12.609	22	0.060
23	0 3.778	0 13.635	0 23.491	0 33.348	0 43.204	0 53.061	1 2.917	1 12.774	23	0.063
24	0 3.943	0 13.799	0 23.656	0 33.512	0 43.368	0 53.225	1 3.081	1 12.938	24	0.066
25	0 4.107	0 13.963	0 23.820	0 33.676	0 43.533	0 53.389	1 3.246	1 13.102	25	0.068
26	0 4.271	0 14.128	0 23.984	0 33.841	0 43.697	0 53.554	1 3.410	1 13.266	26	0.071
27	0 4.435	0 14.292	0 24.148	0 34.005	0 43.861	0 53.718	1 3.574	1 13.431	27	0.074
28	0 4.600	0 14.456	0 24.313	0 34.169	0 44.026	0 53.882	1 3.739	1 13.595	28	0.077
29	0 4.764	0 14.620	0 24.477	0 34.333	0 44.190	0 54.046	1 3.903	1 13.759	29	0.079
30	0 4.928	0 14.785	0 24.641	0 34.498	0 44.354	0 54.211	1 4.067	1 13.924	30	0.082
31	0 5.093	0 14.949	0 24.805	0 34.662	0 44.518	0 54.375	1 4.231	1 14.088	31	0.085
32	0 5.257	0 15.113	0 24.970	0 34.826	0 44.683	0 54.539	1 4.396	1 14.252	32	0.088
33	0 5.421	0 15.278	0 25.134	0 34.990	0 41.847	0 54.703	1 4.560	1 14.416	33	0.090
34	0 5.585	0 15.442	0 25.298	0 35.155	0 45.011	0 54.868	1 4.724	1 14.581	34	0.093
35	0 5.750	0 15.606	0 25.463	0 35.319	0 45.176	0 55.032	1 4.888	1 14.745	35	0.096
36	0 5.914	0 15.770	0 25.627	0 35.483	0 45.340	0 55.196	1 5.053	1 14.909	36	0.099
37	0 6.078	0 15.935	0 25.791	0 35.648	0 45.504	0 55.361	1 5.217	1 15.073	37	0.101
38	0 6.242	0 16.099	0 25.955	0 35.812	0 45.668	0 55.525	1 5.381	1 15.238	38	0.104
39	0 6.407	0 16.263	0 26.120	0 35.976	0 45.833	0 55.689	1 5.546	1 15.402	39	0.107
40	0 6.571	0 16.427	0 26.284	0 36.140	0 45.997	0 55.853	1 5.710	1 15.566	40	0.110
41	0 6.735	0 16.592	0 26.448	0 36.305	0 46.161	0 56.018	1 5.874	1 15.731	41	0.112
42	0 6.900	0 16.756	0 26.612	0 36.469	0 46.325	0 56.182	1 6.038	1 15.895	42	0.115
43	0 7.064	0 16.920	0 26.777	0 36.633	0 46.490	0 56.346	1 6.203	1 16.059	43	0.118
44	0 7.228	0 17.085	0 26.941	0 36.798	0 46.654	0 56.510	1 6.367	1 16.223	44	0.120
45	0 7.392	0 17.249	0 27.105	0 36.962	0 46.818	0 56.675	1 6.531	1 16.388	45	0.123
46	0 7.557	0 17.413	0 27.270	0 37.126	0 46.983	0 56.839	1 6.695	1 16.552	46	0.126
47	0 7.721	0 17.577	0 27.434	0 37.290	0 47.147	0 57.003	1 6.860	1 16.716	47	0.129
48	0 7.885	0 17.742	0 27.598	0 37.455	0 47.311	0 57.168	1 7.024	1 16.881	48	0.131
49	0 8.049	0 17.906	0 27.762	0 37.619	0 47.475	0 57.332	1 7.188	1 17.045	49	0.134
50	0 8.214	0 18.070	0 27.927	0 37.783	0 47.640	0 57.496	1 7.353	1 17.209	50	0.137
51	0 8.378	0 18.234	0 28.091	0 37.947	0 47.804	0 57.660	1 7.517	1 17.373	51	0.140
52	0 8.542	0 18.399	0 28.255	0 38.112	0 47.968	0 57.825	1 7.681	1 17.538	52	0.142
53	0 8.707	0 18.563	0 28.420	0 38.276	0 48.132	0 57.989	1 7.845	1 17.702	53	0.145
54	0 8.871	0 18.727	0 28.584	0 38.440	0 48.297	0 58.153	1 8.010	1 17.866	54	0.148
55	0 9.035	0 18.892	0 28.748	0 38.605	0 48.461	0 58.317	1 8.174	1 18.030	55	0.151
56	0 9.199	0 19.056	0 28.912	0 38.769	0 48.625	0 58.482	1 8.338	1 18.195	56	0.153
57	0 9.364	0 19.220	0 29.077	0 38.933	0 48.790	0 58.646	1 8.502	1 18.359	57	0.156
58	0 9.528	0 19.384	0 29.241	0 39.097	0 48.954	0 58.810	1 8.667	1 18.523	58	0.159
59	0 9.692	0 19.549	0 29.405	0 39.262	0 49.118	0 58.975	1 8.831	1 18.688	59	0.162
Mean Solar.	0 <sup>h</sup>	1 <sup>h</sup>	2 <sup>h</sup>	3 <sup>h</sup>	4 <sup>h</sup>	5 <sup>h</sup>	6 <sup>h</sup>	7 <sup>h</sup>	For Seconds.	



TABLE III.—MEAN SOLAR INTO SIDEREAL TIME.

589

TO BE ADDED TO A MEAN TIME INTERVAL.										
Mean Solar.	8 <sup>h</sup>	9 <sup>h</sup>	10 <sup>h</sup>	11 <sup>h</sup>	12 <sup>h</sup>	13 <sup>h</sup>	14 <sup>h</sup>	15 <sup>h</sup>	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	18.852	18.708	18.565	18.421	18.278	2 8.134	2 17.991	2 27.847	0	0.000
1	19.016	18.873	18.729	18.585	18.442	2 8.298	2 18.155	2 28.011	1	0.003
2	19.180	19.037	18.893	18.750	18.606	2 8.463	2 18.319	2 28.176	2	0.005
3	19.345	19.201	19.058	18.914	18.771	2 8.627	2 18.483	2 28.340	3	0.008
4	19.509	19.365	19.222	19.078	18.935	2 8.791	2 18.648	2 28.504	4	0.011
5	19.673	19.530	19.386	19.243	19.099	2 8.956	2 18.812	2 28.668	5	0.014
6	19.837	19.694	19.550	19.407	19.263	2 9.120	2 18.976	2 28.833	6	0.016
7	20.002	19.858	19.715	19.571	19.428	2 9.284	2 19.141	2 28.997	7	0.019
8	20.166	19.022	19.879	19.735	19.592	2 9.448	2 19.305	2 29.161	8	0.022
9	20.330	19.187	19.043	19.900	19.756	2 9.613	2 19.469	2 29.326	9	0.025
10	20.495	19.351	19.207	19.064	19.920	2 9.777	2 19.633	2 29.490	10	0.027
11	20.659	19.515	19.372	19.228	2 0.085	2 9.941	2 19.798	2 29.654	11	0.030
12	20.823	19.680	19.536	19.393	2 0.249	2 10.105	2 19.962	2 29.818	12	0.033
13	20.987	19.844	19.700	19.557	2 0.413	2 10.270	2 20.126	2 29.983	13	0.036
14	21.152	19.008	19.865	19.721	2 0.578	2 10.434	2 20.290	2 30.147	14	0.038
15	21.316	19.172	19.029	19.885	2 0.742	2 10.598	2 20.455	2 30.311	15	0.041
16	21.480	19.337	19.193	19.050	2 0.906	2 10.763	2 20.619	2 30.476	16	0.044
17	21.644	19.501	19.357	19.214	2 1.070	2 10.927	2 20.783	2 30.640	17	0.047
18	21.809	19.665	19.522	19.378	2 1.235	2 11.091	2 20.948	2 30.804	18	0.049
19	21.973	19.829	19.686	19.542	2 1.399	2 11.255	2 21.112	2 30.968	19	0.052
20	22.137	19.994	19.850	19.707	2 1.563	2 11.420	2 21.276	2 31.133	20	0.055
21	22.302	19.158	19.015	19.871	2 1.727	2 11.584	2 21.440	2 31.297	21	0.057
22	22.466	19.322	19.179	19.035	2 1.892	2 11.748	2 21.605	2 31.461	22	0.060
23	22.630	19.487	19.343	19.200	2 2.056	2 11.912	2 21.769	2 31.625	23	0.063
24	22.794	19.651	19.507	19.364	2 2.220	2 12.077	2 21.933	2 31.790	24	0.066
25	22.959	19.815	19.672	19.528	2 2.385	2 12.241	2 22.098	2 31.954	25	0.068
26	23.123	19.979	19.836	19.692	2 2.549	2 12.405	2 22.262	2 32.118	26	0.071
27	23.287	19.144	19.000	19.857	2 2.713	2 12.570	2 22.426	2 32.283	27	0.074
28	23.451	19.308	19.164	19.021	2 2.877	2 12.734	2 22.590	2 32.447	28	0.077
29	23.616	19.472	19.329	19.185	2 3.042	2 12.898	2 22.755	2 32.611	29	0.079
30	23.780	19.637	19.493	19.349	2 3.206	2 13.062	2 22.919	2 32.775	30	0.082
31	23.944	19.801	19.657	19.514	2 3.370	2 13.227	2 23.083	2 32.940	31	0.085
32	24.109	19.965	19.822	19.678	2 3.534	2 13.391	2 23.247	2 33.104	32	0.088
33	24.273	19.129	19.986	19.842	2 3.699	2 13.555	2 23.412	2 33.268	33	0.090
34	24.437	19.294	19.150	19.007	2 3.863	2 13.720	2 23.576	2 33.432	34	0.093
35	24.601	19.458	19.314	19.171	2 4.027	2 13.884	2 23.740	2 33.597	35	0.096
36	24.766	19.622	19.479	19.335	2 4.192	2 14.048	2 23.905	2 33.761	36	0.099
37	24.930	19.786	19.643	19.499	2 4.356	2 14.212	2 24.069	2 33.925	37	0.101
38	25.094	19.951	19.807	19.664	2 4.520	2 14.377	2 24.233	2 34.090	38	0.104
39	25.259	19.115	19.971	19.828	2 4.684	2 14.541	2 24.397	2 34.254	39	0.107
40	25.423	19.279	19.136	19.992	2 4.849	2 14.705	2 24.562	2 34.418	40	0.110
41	25.587	19.444	19.300	19.156	2 5.013	2 14.869	2 24.726	2 34.582	41	0.112
42	25.751	19.608	19.464	19.321	2 5.177	2 15.034	2 24.890	2 34.747	42	0.115
43	25.916	19.772	19.629	19.485	2 5.342	2 15.198	2 25.054	2 34.911	43	0.118
44	26.080	19.936	19.793	19.649	2 5.506	2 15.362	2 25.219	2 35.075	44	0.120
45	26.244	19.101	19.957	19.814	2 5.670	2 15.527	2 25.383	2 35.239	45	0.123
46	26.408	19.265	19.121	19.978	2 5.834	2 15.691	2 25.547	2 35.404	46	0.126
47	26.573	19.429	19.286	19.142	2 5.999	2 15.855	2 25.712	2 35.568	47	0.129
48	26.737	19.593	19.450	19.306	2 6.163	2 16.019	2 25.876	2 35.732	48	0.131
49	26.901	19.758	19.614	19.471	2 6.327	2 16.184	2 26.040	2 35.897	49	0.134
50	27.066	19.922	19.778	19.635	2 6.491	2 16.348	2 26.204	2 36.061	50	0.137
51	27.230	19.086	19.943	19.799	2 6.656	2 16.512	2 26.369	2 36.225	51	0.140
52	27.394	19.251	19.107	19.964	2 6.820	2 16.676	2 26.533	2 36.389	52	0.142
53	27.558	19.415	19.271	19.128	2 6.984	2 16.841	2 26.697	2 36.554	53	0.145
54	27.723	19.579	19.436	19.292	2 7.149	2 17.005	2 26.861	2 36.718	54	0.148
55	27.887	19.743	19.600	19.456	2 7.313	2 17.169	2 27.026	2 36.882	55	0.151
56	28.051	19.908	19.764	19.621	2 7.477	2 17.334	2 27.190	2 37.047	56	0.153
57	28.215	19.072	19.928	19.785	2 7.641	2 17.498	2 27.354	2 37.211	57	0.156
58	28.380	19.236	19.093	19.949	2 7.806	2 17.662	2 27.519	2 37.375	58	0.159
59	28.544	19.400	19.257	19.113	2 7.970	2 17.826	2 27.683	2 37.539	59	0.162
Mean Solar.	8 <sup>h</sup>	9 <sup>h</sup>	10 <sup>h</sup>	11 <sup>h</sup>	12 <sup>h</sup>	13 <sup>h</sup>	14 <sup>h</sup>	15 <sup>h</sup>	For Seconds.	

TABLE III.—MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.									
Mean Solar.	16 <sup>h</sup>	17 <sup>h</sup>	18 <sup>h</sup>	19 <sup>h</sup>	20 <sup>h</sup>	21 <sup>h</sup>	22 <sup>h</sup>	23 <sup>h</sup>	For Seconds.
m s	m s	m s	m s	m s	m s	m s	m s	m s	s s
0	2 37.704	2 47.560	2 57.417	3 7.273	3 17.129	3 26.986	3 36.842	3 46.699	0 0.000
1	2 37.868	2 47.724	2 57.581	3 7.437	3 17.294	3 27.150	3 37.007	3 46.863	1 0.003
2	2 38.032	2 47.889	2 57.745	3 7.602	3 17.458	3 27.315	3 37.171	3 47.027	2 0.005
3	2 38.196	2 48.053	2 57.909	3 7.766	3 17.622	3 27.479	3 37.335	3 47.192	3 0.008
4	2 38.361	2 48.217	2 58.074	3 7.930	3 17.787	3 27.643	3 37.500	3 47.356	4 0.011
5	2 38.525	2 48.381	2 58.238	3 8.094	3 17.951	3 27.807	3 37.664	3 47.520	5 0.014
6	2 38.689	2 48.546	2 58.402	3 8.259	3 18.115	3 27.972	3 37.828	3 47.685	6 0.016
7	2 38.854	2 48.710	2 58.566	3 8.423	3 18.279	3 28.136	3 37.992	3 47.849	7 0.019
8	2 39.018	2 48.874	2 58.731	3 8.587	3 18.444	3 28.300	3 38.157	3 48.013	8 0.022
9	2 39.182	2 49.039	2 58.895	3 8.751	3 18.608	3 28.464	3 38.321	3 48.177	9 0.025
10	2 39.346	2 49.203	2 59.059	3 8.916	3 18.772	3 28.629	3 38.485	3 48.342	10 0.027
11	2 39.511	2 49.367	2 59.224	3 9.080	3 18.937	3 28.793	3 38.649	3 48.506	11 0.030
12	2 39.675	2 49.531	2 59.388	3 9.244	3 19.101	3 28.957	3 38.814	3 48.670	12 0.033
13	2 39.839	2 49.696	2 59.552	3 9.409	3 19.265	3 29.122	3 38.978	3 48.834	13 0.036
14	2 40.003	2 49.860	2 59.716	3 9.573	3 19.429	3 29.286	3 39.142	3 48.999	14 0.038
15	2 40.168	2 50.024	2 59.881	3 9.737	3 19.594	3 29.450	3 39.307	3 49.163	15 0.041
16	2 40.332	2 50.188	3 0.045	3 9.901	3 19.758	3 29.614	3 39.471	3 49.327	16 0.044
17	2 40.496	2 50.353	3 0.209	3 10.066	3 19.922	3 29.779	3 39.635	3 49.492	17 0.047
18	2 40.661	2 50.517	3 0.373	3 10.230	3 20.086	3 29.943	3 39.799	3 49.656	18 0.049
19	2 40.825	2 50.681	3 0.538	3 10.394	3 20.251	3 30.107	3 39.964	3 49.820	19 0.052
20	2 40.989	2 50.846	3 0.702	3 10.559	3 20.415	3 30.271	3 40.128	3 49.984	20 0.055
21	2 41.153	2 51.010	3 0.866	3 10.723	3 20.579	3 30.436	3 40.292	3 50.149	21 0.057
22	2 41.318	2 51.174	3 1.031	3 10.887	3 20.744	3 30.600	3 40.456	3 50.313	22 0.060
23	2 41.482	2 51.338	3 1.195	3 11.051	3 20.908	3 30.764	3 40.621	3 50.477	23 0.063
24	2 41.646	2 51.503	3 1.359	3 11.216	3 21.072	3 30.929	3 40.785	3 50.642	24 0.066
25	2 41.810	2 51.667	3 1.523	3 11.380	3 21.236	3 31.093	3 40.949	3 50.806	25 0.068
26	2 41.975	2 51.831	3 1.688	3 11.544	3 21.401	3 31.257	3 41.114	3 50.970	26 0.071
27	2 42.139	2 51.995	3 1.852	3 11.708	3 21.565	3 31.421	3 41.278	3 51.134	27 0.074
28	2 42.303	2 52.160	3 2.016	3 11.873	3 21.729	3 31.586	3 41.442	3 51.299	28 0.077
29	2 42.468	2 52.324	3 2.181	3 12.037	3 21.893	3 31.750	3 41.606	3 51.463	29 0.079
30	2 42.632	2 52.488	3 2.345	3 12.201	3 22.058	3 31.914	3 41.771	3 51.627	30 0.082
31	2 42.796	2 52.653	3 2.509	3 12.366	3 22.222	3 32.078	3 41.935	3 51.791	31 0.085
32	2 42.960	2 52.817	3 2.673	3 12.530	3 22.386	3 32.243	3 42.099	3 51.956	32 0.088
33	2 43.125	2 52.981	3 2.838	3 12.694	3 22.551	3 32.407	3 42.264	3 52.120	33 0.090
34	2 43.289	2 53.145	3 3.002	3 12.858	3 22.715	3 32.571	3 42.428	3 52.284	34 0.093
35	2 43.453	2 53.310	3 3.166	3 13.023	3 22.879	3 32.736	3 42.592	3 52.449	35 0.096
36	2 43.617	2 53.474	3 3.330	3 13.187	3 23.043	3 32.900	3 42.756	3 52.613	36 0.099
37	2 43.782	2 53.638	3 3.495	3 13.351	3 23.208	3 33.064	3 42.921	3 52.777	37 0.101
38	2 43.946	2 53.803	3 3.659	3 13.515	3 23.372	3 33.228	3 43.085	3 52.941	38 0.104
39	2 44.110	2 53.967	3 3.823	3 13.680	3 23.536	3 33.393	3 43.249	3 53.106	39 0.107
40	2 44.275	2 54.131	3 3.988	3 13.844	3 23.700	3 33.557	3 43.413	3 53.270	40 0.110
41	2 44.439	2 54.295	3 4.152	3 14.008	3 23.865	3 33.721	3 43.578	3 53.434	41 0.112
42	2 44.603	2 54.460	3 4.316	3 14.173	3 24.029	3 33.886	3 43.742	3 53.598	42 0.115
43	2 44.767	2 54.624	3 4.480	3 14.337	3 24.193	3 34.050	3 43.906	3 53.763	43 0.118
44	2 44.932	2 54.788	3 4.645	3 14.501	3 24.358	3 34.214	3 44.071	3 53.927	44 0.120
45	2 45.096	2 54.952	3 4.809	3 14.665	3 24.522	3 34.378	3 44.235	3 54.091	45 0.123
46	2 45.260	2 55.117	3 4.973	3 14.830	3 24.686	3 34.543	3 44.399	3 54.256	46 0.126
47	2 45.425	2 55.281	3 5.137	3 14.994	3 24.850	3 34.707	3 44.563	3 54.420	47 0.129
48	2 45.589	2 55.445	3 5.302	3 15.158	3 25.015	3 34.871	3 44.728	3 54.584	48 0.131
49	2 45.753	2 55.610	3 5.466	3 15.322	3 25.179	3 35.035	3 44.892	3 54.748	49 0.134
50	2 45.917	2 55.774	3 5.630	3 15.487	3 25.343	3 35.200	3 45.056	3 54.913	50 0.137
51	2 46.082	2 55.938	3 5.795	3 15.651	3 25.508	3 35.364	3 45.220	3 55.077	51 0.140
52	2 46.246	2 56.102	3 5.959	3 15.815	3 25.672	3 35.528	3 45.385	3 55.241	52 0.142
53	2 46.410	2 56.267	3 6.123	3 15.980	3 25.836	3 35.693	3 45.549	3 55.405	53 0.145
54	2 46.574	2 56.431	3 6.287	3 16.144	3 26.000	3 35.857	3 45.713	3 55.570	54 0.148
55	2 46.739	2 56.595	3 6.452	3 16.308	3 26.165	3 36.021	3 45.878	3 55.734	55 0.151
56	2 46.903	2 56.759	3 6.616	3 16.472	3 26.329	3 36.185	3 46.042	3 55.898	56 0.153
57	2 47.067	2 56.924	3 6.780	3 16.637	3 26.493	3 36.350	3 46.206	3 56.063	57 0.156
58	2 47.232	2 57.088	3 6.944	3 16.801	3 26.657	3 36.514	3 46.370	3 56.227	58 0.159
59	2 47.396	2 57.252	3 7.109	3 16.965	3 26.822	3 36.678	3 46.535	3 56.391	59 0.162
Mean Solar.	16 <sup>h</sup>	17 <sup>h</sup>	18 <sup>h</sup>	19 <sup>h</sup>	20 <sup>h</sup>	21 <sup>h</sup>	22 <sup>h</sup>	23 <sup>h</sup>	For Seconds.

## TABLE FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS.

Reduce the observed altitude of Polaris to the true altitude.

Reduce the recorded time of observation to the local sidereal time.

If the sidereal time is  $\left\{ \begin{array}{l} \text{less than } 1^{\text{h}} 24^{\text{m}}.9, \text{ subtract it from } 1^{\text{h}} 24^{\text{m}}.9; \\ \text{between } 1^{\text{h}} 24^{\text{m}}.9 \text{ and } 13^{\text{h}} 24^{\text{m}}.9, \text{ subtract } 1^{\text{h}} 24^{\text{m}}.9 \text{ from it;} \\ \text{greater than } 13^{\text{h}} 24^{\text{m}}.9, \text{ subtract it from } 25^{\text{h}} 24^{\text{m}}.9; \end{array} \right.$

and the remainder is the hour-angle of Polaris.

With this hour-angle take out the correction from Table IV (below), and add it to or subtract it from the true altitude, according to its sign. The result is the approximate latitude of the place.

*Example.*—1904, October 27, at  $10^{\text{h}} 40^{\text{m}} 30^{\text{s}}$ , P. M., mean solar time, in longitude  $29^{\circ}$  east of Greenwich, suppose the true altitude of Polaris to be  $43^{\circ} 20'$ : required the latitude of the place.

Local astronomical mean time	h	m	s
Reduction from Table III, for $10^{\text{h}} 40^{\text{m}} 30^{\text{s}}$	10	40	30
Greenwich sidereal time of mean noon, October 27, page 165	+	1	45
Reduction from Table III, for longitude ( $= 1^{\text{h}} 56^{\text{m}}$ east, or minus)	14	21	39
Sum (having regard to signs) is equal to local sidereal time	—	0	19
	1	3	35
Subtract sidereal time	h	m	s
Remainder is equal to hour-angle of Polaris	1	24	54
	1	3	35
	0	21	19
True altitude	+	43	20
Correction from Table IV (below)	—	1	12
Approximate latitude	+	42	8

TABLE IV.—1904.

Hour-angle.	0 <sup>h</sup>	1 <sup>h</sup>	2 <sup>h</sup>	3 <sup>h</sup>	4 <sup>h</sup>	5 <sup>h</sup>
m						
0	— 0 12.2	— 0 9.7	— 0 2.3	— 0 50.7	— 0 35.5	— 0 18.0
5	1 12.2 0.0	1 9.3 0.4	1 1.5 0.8	0 49.5 1.2	0 34.1 1.4	0 16.4 1.6
10	1 12.1 0.1	1 8.8 0.5	1 0.7 0.8	0 48.4 1.1	0 32.7 1.4	0 14.9 1.5
15	1 12.0 0.1	1 8.3 0.5	0 59.8 0.9	0 47.2 1.2	0 31.3 1.4	0 13.4 1.6
20	— 1 11.9	— 1 7.8	— 0 58.9	— 0 46.0	— 0 29.9	— 0 11.8
25	1 11.8 0.1	1 7.2 0.6	0 58.0 0.9	0 44.7 1.3	0 28.4 1.5	0 10.2 1.6
30	1 11.6 0.2	1 6.6 0.6	0 57.0 1.0	0 43.5 1.2	0 27.0 1.4	0 8.7 1.5
35	1 11.3 0.3	1 6.0 0.6	0 56.0 1.0	0 42.2 1.3	0 25.5 1.5	0 7.1 1.6
40	— 1 11.1	— 1 5.3	— 0 55.0	— 0 40.9	— 0 24.0	— 0 5.5
45	1 10.8 0.3	1 4.6 0.7	0 54.0 1.0	0 39.6 1.3	0 22.5 1.5	0 4.0 1.5
50	1 10.4 0.4	1 3.9 0.7	0 52.9 1.1	0 38.2 1.4	0 21.0 1.5	0 2.4 1.6
55	1 10.1 0.3	1 3.1 0.8	0 51.8 1.1	0 36.9 1.3	0 19.5 1.5	— 0 0.8 1.6
60	— 1 9.7 0.4	— 1 2.3 0.8	— 0 50.7 1.1	— 0 35.5 1.4	— 0 18.0 1.5	+ 0 0.8 1.6
Hour-angle.	6 <sup>h</sup>	7 <sup>h</sup>	8 <sup>h</sup>	9 <sup>h</sup>	10 <sup>h</sup>	11 <sup>h</sup>
m						
0	+ 0 0.8	+ 0 19.4	+ 0 36.7	+ 0 51.4	+ 1 2.7	+ 1 9.8
5	0 2.3 1.5	0 20.9 1.5	0 38.0 1.3	0 52.5 1.1	1 3.5 0.7	1 10.2 0.4
10	0 3.9 1.6	0 22.4 1.5	0 39.3 1.3	0 53.6 1.1	1 4.2 0.7	1 10.5 0.3
15	0 5.5 1.5	0 23.9 1.5	0 40.6 1.3	0 54.6 1.0	1 4.9 0.7	1 10.8 0.3
20	+ 0 7.0	+ 0 25.4	+ 0 41.9	+ 0 55.6	+ 1 5.6	+ 1 11.1
25	0 8.6 1.6	0 26.8 1.4	0 43.2 1.3	0 56.6 1.0	1 6.2 0.6	1 11.4 0.3
30	0 10.2 1.6	0 28.3 1.5	0 44.4 1.2	0 57.6 1.0	1 6.8 0.6	1 11.6 0.2
35	0 11.7 1.5	0 29.7 1.4	0 45.7 1.2	0 58.5 0.9	1 7.4 0.5	1 11.8 0.1
40	+ 0 13.3	+ 0 31.1	+ 0 46.9	+ 0 59.4	+ 1 7.9	+ 1 11.9
45	0 14.8 1.5	0 32.5 1.4	0 48.0 1.1	1 0.3 0.9	1 8.4 0.5	1 12.0 0.1
50	0 16.4 1.6	0 33.9 1.4	0 49.2 1.2	1 1.1 0.8	1 8.9 0.5	1 12.1 0.1
55	0 17.9 1.5	0 35.3 1.4	0 50.3 1.1	1 1.9 0.8	1 9.4 0.5	1 12.2 0.1
60	+ 0 19.4 1.5	+ 0 36.7 1.4	+ 0 51.4 1.1	+ 1 2.7 0.8	+ 1 9.8 0.4	+ 1 12.2 0.0













